



Arlington Conservation Commission

Date: Thursday, May 21, 2020
Time: 7:30 PM
Location: Conducted by Remote Participation

Agenda

1. Administrative
 - a. In accordance with the Governor's Order Suspending Certain Provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the May 21, 2020 public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom.

Topic: Conservation Commission Meeting
Time: May 21, 2020 07:30 PM Eastern Time (US and Canada)

Join Zoom Meeting
<https://zoom.us/j/862364087>
Meeting ID: 862 364 087
Meeting Password: 894050

One tap mobile
Call-in: +1 312 626 6799
+1 646 876 9923
Meeting Number: 862 364 087#

Members of the public are strongly encouraged to send written comment regarding any of the hearings listed below to Conservation Agent Emily Sullivan at esullivan@town.arlington.ma.us.

Please read Governor Baker's Executive Order Suspending Certain Provision of Open Meeting Law for more information regarding virtual public hearings and meetings: <https://www.mass.gov/doc/open-meeting-law-order-march-12-2020/download>

- b. Review draft 05/07/2020 meeting minutes.
 - c. Administrative update.
2. Discussion
 - a. Regulations Update: Administrative Review
3. Hearings

Notice of Intent: 869 Massachusetts Ave

Notice of Intent: 869 Massachusetts Ave, Arlington High School

This Notice of Intent (NOI) has not yet been presented to the Conservation Commission, and this meeting is the first opportunity for public comment. It is strongly encouraged that members of the public submit written comment for this NOI to the Conservation Agent in advance of the hearing, by emailing Emily Sullivan at esullivan@town.arlington.ma.us. All materials submitted for this NOI can be found on the Commission's agenda and minutes page, under the agenda for the 05/21/2020 meeting.

Hearing Summary:

The proposed project includes razing the existing high school and constructing a new high school with associated new paved parking areas, landscaping, athletic fields, bathroom building, utilities, and a new stormwater management system in accordance with the Massachusetts DEP Stormwater Standards. The existing football stadium will remain as is and is not included within the scope of this project.

Deliberation: Notice of Intent: 1297 Massachusetts Ave

This Notice of Intent (NOI) was presented to the Conservation Commission at its 04/16/2020 and 05/07/2020 meetings. It is strongly encouraged that members of the public submit written comment for this NOI to the Conservation Agent in advance of the hearing, by emailing Emily Sullivan at esullivan@town.arlington.ma.us. All materials submitted for this NOI can be found on the Commission's agenda and minutes page, under the agenda for the 05/21/2020 meeting.

Hearing Summary:

This project proposes the excavation and remediation of soil contaminated by commercial kitchen soy bean oil grease within the 100-ft Wetlands Buffer.

Deliberation: Notice of Intent: 105 Lafayette Street

This Notice of Intent (NOI) was presented to the Commission during its 05/07/2020 meeting. It is strongly encouraged that members of the public submit written comment for this NOI to the Conservation Agent in advance of the hearing, by emailing Emily Sullivan at esullivan@town.arlington.ma.us. All materials submitted for this NOI can be found on the Commission's agenda and minutes page, under the agenda for the 05/21/2020 meeting.

Hearing Summary:

This project proposes to raze and construct a single family home within the 100-ft Wetlands Buffer, 200-ft Riverfront Area, and floodplain.



Town of Arlington, Massachusetts

Zoom Access Information

Summary:

In accordance with the Governor's Order Suspending Certain Provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the May 21, 2020 public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom.

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Town of Arlington, Massachusetts

Draft 05/07/2020 Meeting Minutes

Summary:

Review draft 05/07/2020 meeting minutes.

ATTACHMENTS:

Type	File Name	Description
Minutes	DRAFT_05072020_Minutes_Conservation_Commission.pdf	Draft 05/07/2020 meeting minutes



Arlington Conservation Commission

Date: May 7, 2020

Time: 7:30pm

Location: Conducted through Remote Participation using Zoom

Minutes

Attendance: Commission Members Susan Chapnick (Chair), Pam Heidell, Dave Kaplan, Nathaniel Stevens, Chuck Tirone (Vice Chair), and David White; Associate Commissioners Cathy Garnett and Mike Gildesgame; and Conservation Agent Emily Sullivan. Members of the public included Trevor Smith, Peter Howard, Russ Barton, Rich Kirby, Al Gala, Lori Philbin .

04/02/2020 Meeting Minutes

The Commission discussed edits to the draft 04/02/2020 minutes. N. Stevens motioned to approve the minutes as edited, C. Tirone seconded, all were in favor, motion approved.

04/16/2020 Meeting Minutes

The Commission discussed edits to the draft 04/16/2020 minutes. D. White motioned to approve the minutes as edited, N. Stevens seconded, all were in favor, motion approved.

Enforcement Order: 39 Wellington Street

Documents Reviewed:

- 1) Notice of Enforcement Order, dated 08/15/2019
- 2) Enforcement Order, dated 08/07/2019
- 3) Howard Conservation Project Plan, prepared by A Yard and A Half Landscaping Cooperative, Inc., dated 4/17/2020
- 4) Howard Conservation Project Planting List, prepared by A Yard and A Half Landscaping Cooperative, Inc., not dated

Resource Areas:

- 1) Spy Pond
- 2) 100-ft Wetlands Buffer
- 3) Adjacent Upland Resource Area

S. Chapnick provided a summary of the enforcement order. In August 2019, the Commission became aware that Park and Recreation owned land, adjacent to 39 Wellington Street and abutting Spy Pond had been clear-cut of vegetation. This work was not approved by the Park and Recreation Commission or the Conservation Commission.

T. Smith, [the Applicant's representative](#), presented a proposed restoration plan and planting list to the Commission. The proposed restoration plan includes a multi-storied plant concept with trees, bushes, ~~and~~ shrubs, [and flowering plants](#). The planting list includes [native](#) plants with strong root systems to mitigate erosion into Spy Pond, and consists of native plants.

The Commission reviewed and discussed the proposals. The Commission agreed with the multi-storied planting plan, [with some discussion about where different species would be planted](#). The Commission requested that a 2-inch layer of compost be placed onsite prior to planting. T. Smith said this was agreeable, and stated that after the plants are planted, the site will be topped with aged wood chips. The Commission also requested that one more tree be planted onsite to better align with the Arlington Bylaw for [replacement vegetation](#) ~~Wetlands Protection requirements~~.

The Commission asked T. Smith to revise the proposed plan with the requests discussed, and then resubmit the plan to E. Sullivan. E. Sullivan will then share the plan with the Park & Recreation Commission and Tree Warden for review and feedback. Once the plan is reviewed by the additional parties, the Commission requests that the Applicant and Representative attend the Commission's first July meeting to receive formal approval to proceed with the proposed project.

N. Stevens motioned to update ~~the~~ the enforcement order to state that the Applicant must return [to](#) the Commission on 07/09/2020 for final review and approval of the plan after the plan [has](#) received input from the Park & Recreation Commission and Tree Warden. D. White seconded, all were in favor, motion approved.

**Notice of Intent: 1297 Mass Ave
MassDEP File #091-0321**

Documents Reviewed:

- 1) Notice of Intent for work at 1297 Mass Ave, Arlington MA dated 03/03/2020

Resource Areas:

- 1) Mill Brook
- 2) 100-Foot Wetlands Buffer Zone
- 3) 100-Foot Adjacent Upland Resource Area
- 4) 200-Foot Riverfront Area

[The Applicant's representative](#), R. Barton, presented the project. This project proposes the excavation and remediation of soil contaminated by commercial kitchen soy bean oil grease within the 100-ft Wetlands Buffer and 200-ft Riverfront Area.

The Commission requested the following additional information during its 04/16/2020 meeting, which was provided by the Applicant's Representative:

- 1) A weekly inspection record form for the grease waste container
- 2) Add shrubs/plugs in addition to the grass mix proposed
- 3) Amend the plans to include a 12" compost sock as erosion control

M. Gildesgame requested that the weekly inspection report be revised to include a space for inspectors to record whether a pump out is necessary, and the date of the pump out. M. Gildesgame also recommended that a spill kit be placed onsite in the event that there is a spill. C. Tirone requested that the Conservation Agent be notified in the event of a spill, and that the Conservation Agent's phone number be added to the weekly inspection form. N. Stevens requested that 2 years of inspection reports be kept onsite and be available by request.

The Commission discussed whether or not the proposed [mitigation](#) planting plan should include cinnamon ferns or sweet ferns, and stated that it deferred to the Applicant [to choose an appropriate species that would tolerate the shade and slope of the area to be planted](#).

D. Kaplan requested that when the erosion controls are staked, they be staked on the resource area side, and not through the compost sock.

N. Stevens motioned to close the public hearing, D. Kaplan seconded, all were in favor, motioned approved.

The Commission requested that E. Sullivan [prepare a](#) draft [an approval](#) permit for the 05/21/2020 meeting for the Commission's deliberation.

**Notice of Intent: 105 Lafayette Street
MassDEP File #091-0322**

Documents Reviewed:

- 1) *Notice of Intent for work at 105 Lafayette Street, Arlington MA prepared by LEC Environmental, dated 04/20/2020*
- 2) *105 Lafayette Street NOI Planset, prepared by Gala Simon Associates Inc, revised 03/26/2020*

Resource Areas:

- 1) *Alewife Brook*
- 2) *100-Foot Wetlands Buffer Zone*
- 3) *100-Foot Adjacent Upland Resource Area*
- 4) *200-Foot Riverfront Area*
- 5) *Bordering Land Subject to Flooding*

[The Applicant's representatives](#), R. Kirby and A. Gala, presented the project. This project proposes to raze and construct a single family home within the 100-ft Wetlands Buffer, 100-ft Adjacent Upland Resource Area 200-ft Riverfront Area, and floodplain.

P. Heidell [askeds](#) for more information about the proposed flood vents. R. Kirby said that the flood vents are required to meet FEMA building code⁷, and that Inspectional Services and the Engineering Division will also review the flood vents. P. Heidell asked where the mechanical units are proposed within the house^{2,5}. A. Gala stated on the first floor.

S. Chapnick asked if the plans have been reviewed by the Engineering Division yet. R. Kirby said that the project does not trigger the Town's Stormwater Bylaw, and that the project has not yet filed for a building permit ~~yet~~.

C. Garnett stated that she would like to see an invasives management plan for the site. C. Tirone recommended that the project include stripping the topsoil off and replacing it with new soil to grade, which should help invasives management.

P. Heidell asked if the existing sheds were on public property, or on the Applicant's property. A. Gala stated that the sheds were on public property, and that ~~with~~ the MBTA or Town of Arlington owns the property. P. Heidell requested that a new fence not be placed on the public property, and that the project's impervious surface reduction calculations not include the sheds since they are not on the Applicant's property.

N. Stevens asked for clarification regarding the shed area, and whether the area will be planted with lawn or shrubs once the sheds are removed. P. Heidell asked whether the Applicant should plant shrubs on public land since it is not the Applicant's land. N. Stevens requested that all mitigation plantings and shrubs be planted on the Applicant's property, since the entire property is within the resource areas.

The Commission requested the following information and changes from the Applicant:

- 1) Remove note about fence to be replaced, and add note stating that the existing fence is to be removed on the easement/MBTA/Town property
- 2) Add note stating that 12 plants from Arlington Conservation Commission native plant list to be added someplace onsite
- 3) Add note stating that topsoil will be replaced with new soil to grade
- 4) Recalculate impervious surface reduction so that sheds are not included

N. Stevens motioned to close the public hearing, C. Tirone seconded, all were in favor, motioned approved.

The Commission requested that E. Sullivan prepare a draft ~~an approval~~ permit for the 05/21/2020 meeting for the Commission's deliberation.

**Deliberation: Notices of Intent: 47 Spy Pond Lane Lots 1/A and 2/B NOIs
MassDEP File #s 091-0317 and 0961-0317**

Documents Reviewed:

- 1) Notice of Intent for work at 47 Spy Pond Lane (Lot 1/Lot A), Arlington, MA dated 02/20/2020
- 2) Notice of Intent for work at 47 Spy Pond Lane (Lot 2/Lot B), Arlington, MA dated 02/20/2020

Resource Areas:

- 1) Spy Pond
- 2) 100-Foot Wetlands Buffer Zone
- 4) Bordering Land Subject to Flooding
- 5) Bank

The Commission reviewed the draft permits for both projects. The Commission discussed the special conditions of the draft permits, including:

- At least 21 days prior to the start of any construction on Lot 1/A, the Applicant shall submit a signed agreement between the Town of Arlington and Seaver Construction for the acceptance and maintenance of the off-site stormwater treatment unit.
- Before the Applicant named in this Order sells or conveys either Lot 1/A or Lot 2/B whichever occurs first, the Applicant shall submit for Conservation Commission approval a restrictive covenant that any pervious surfaces shown on the plan outside of the Commission's jurisdiction shall remain pervious. The restrictive covenant shall benefit and be enforceable by the Conservation Commission and the Town of Arlington. Before either property is sold (whichever occurs first), the restrictive covenant must be executed and recorded, and proof of recording provided to the Commission.
- The Applicant shall include the Arlington Conservation Commission's Agent on all communication related to the necessary Chapter 91 Licensing in order to move the location of the existing dock to the boundary of Lots 1/A and 2/B. The Applicant shall not later than September 1, 2020 file a formal request to MassDEP's Waterways Division its request to relocate the dock. If MassDEP does not grant permission to relocate the dock, the Applicant shall remove it.
- The Applicant must hire a qualified environmental monitor to be on-site during project construction. The monitor shall submit an electronic report to the Conservation Agent twice a month regarding construction progress and relation to resource areas. The qualified environmental monitor shall also submit an electronic report after every rain event exceeding 0.5 inches of rain during the duration of construction to the Conservation Agent regarding the condition of the site during and after the rain event, as well as the status erosion controls and any additional measures to address stormwater management issues caused by said rain event.
- The Applicant must hire a qualified planting monitor to oversee the installation of the vegetated buffer plantings installation. The qualified monitor shall be a certified landscape architect. A planting report must be submitted to the Conservation Commission within 10 days of the completion of the plant installation. The planting report shall include an as-installed plan and a list of what was planted (including Latin and common names, size of each plant, quantity of each species).
- The Applicant must hire a qualified stormwater monitor or engineer to oversee the installation of the on-site stormwater infiltration unit, permeable pavers, and off-site stormwater mitigation unit. The qualified stormwater monitor shall be a certified engineer. A stormwater mitigation report must be submitted to the Conservation Commission within 10 days of the completion of the stormwater infiltration units and permeable pavers installation. The stormwater report shall included as-built plans, photographs from installation, and a written summary of the installation of the on-site stormwater infiltration unit, permeable pavers, and off-site stormwater mitigation unit. The stormwater monitor shall submit separate

Comment [SC1]: I didn't check these – please make sure they are copied from the permits as approved so we don't have any difference in phrasing that could cause confusion at a later date. – Thanks!

Comment [e2]: These are from the permits as approved

reports for the on-site stormwater infiltration unit, permeable pavers, and off-site stormwater mitigation unit.

- When requesting a Certificate of Compliance for this Order of Conditions, the Applicant must submit a written statement from either (1) Massachusetts professional engineer and registered land surveyor, or (2) registered land surveyor and landscape architect certifying that the completed work complies with the plans referenced in this Order, or provide an as-built plan and statement describing any differences.
- Certification must be provided to the Commission that the Order of Conditions has been conveyed and received by any new owner of the property, so that new owners were apprised of the continuing conditions of this permit. This shall be a continuing condition that
- A power-broom must be kept onsite at all times to conduct the daily workday street sweeping along the construction entrance and street within the property boundaries.
- Any dirt or debris spilled or tracked onto any paved streets shall be swept up and removed daily with a power-broom.
- At least 21 days prior to plant installation, the Applicant shall submit an invasive plant management plan to the Conservation Commission. The plan shall focus on invasive plant management for the vegetated buffer area. The plan's recommendations shall be performed by the Applicant and the recommendations shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.
- The unmortared and dry laid stone wall approved to delineate the vegetated buffer area shall remain as unmortared and dry laid. This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.
- A metal (or other permanent material) sign or marker shall be installed on or along the unmortared wall to demarcate the conservation area. Specifications and a plan for the sign shall be submitted to the Commission for approval 21 days prior to the construction of the wall. The permanent sign or marker shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.
- The on-site infiltration system shall be maintained according to the manufacturer best management practices and operations/maintenance plan. The system shall be checked twice a year to ensure compliance with the best management practices and operations/maintenance plan. An annual report shall be submitted to the Conservation Commission and Town Engineer demonstrating that the operation and maintenance of the unit was performed per the manufacturer best management practices. This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.
- The off-site Vortech unit shall be purchased and installed by the Applicant at the Applicant's expense. The Town of Arlington shall take over the maintenance of the unit per the conservations documented with the Town Engineer, only when the Town Engineer is satisfied with the function of the unit. The off-site unit shall be installed and operational within 12 months of the issuance of the Order of Conditions.

- The Applicant must obtain a letter from the Town Engineer that the off-site stormwater unit was installed properly and accepted by the Arlington Department of Public Works, and send it to the Commission.
- The dock on Lot 1/A must either be relocated to the property boundary between Lots 1/A and 2/B, or fully removed and abandoned before the Applicant named in this Order sells or conveys either Lot 1/A or Lot 2/B whichever occurs first.

N. Stevens motioned to approve the project for 47 Spy Pond Lane Lot 1/Lot A under the Wetlands Protection Act with the special conditions discussed by the Commission, P. Heidell seconded, five Commissioners approved the motion, Commissioner [C. Tirone](#) opposed the motion, motion approved.

N. Stevens motioned to approve the project for 47 Spy Pond Lane Lot 2/Lot B under the Wetlands Protection Act with the special conditions discussed by the Commission, D. Kaplan seconded, five Commissioners approved the motion, Commissioner [C. Tirone](#) opposed the motion, motion approved.

D. White motioned to close the Commission meeting, N. Stevens seconded, all were in favor, motioned approved.

Meeting adjourned at 10:35pm.



Town of Arlington, Massachusetts

Administrative Update

Summary:

Administrative update.



Town of Arlington, Massachusetts

Regulation Update

Summary:

Regulations Update: Administrative Review

ATTACHMENTS:

	Type	File Name	Description
▢	Reference Material	Section_on_Admin_Review - _Draft_Clean_02272020.pdf	Draft Administrative Review Section

Section ?? – Administrative Review of Minor Projects or Work

[I suggest inserting these as a new Section 8 and moving the other sections accordingly-NS]

A. Findings

Some projects are simple, small in scale, minor, or routine, and such projects involve very little activity or alteration in Resource Areas protected by the Bylaw and are not likely to have a significant or cumulative effect on the Resource Area Values protected by the Bylaw. Such projects usually may be reviewed and approved by the Conservation Agent rather than the full Commission.

Comment [P1]: Clarify they need to be reviewed even if they do not need to be reviewed under WPA

B. Applicability

If a project meets the criteria in Section 8?? B.(1) or (2) below, the work may be reviewed and approved by the Conservation Agent. If the Conservation Agent has any doubt that a project meets these criteria, the Applicant will be required to file a Request for Determination of Applicability or a full application for a permit (Notice of Intent).

(1) A project that is listed in B(2) below may be approved by the Conservation Agent if it meets all of the following conditions:

- a. The work is proposed only in the AURA or Riverfront Area and not in any other Resource Area.
- b. Work is not proposed within the first 50 feet of the AURA or Riverfront Area other than conversion of impervious surface to vegetated area provided erosion and sedimentation controls are implemented during construction;
- c. No uprooting of non-invasive vegetation and not mowing to the ground or clear-cutting is proposed;
- d. Work will not adversely impact the climate change resilience functions of the project area

(2) A project may be approved by the Conservation Agent if it falls within one of the following activities and it meets the conditions listed in B(1) above:

- a. Fencing, provided that it will not constitute a barrier to wildlife movement and there are openings along the bottom at least 4 inches high to allow wildlife movement; a sketch or survey of the property showing the proposed fence location must accompany the application.
- b. Installation of dried laid (not mortared) stone walls and compacted gravel footing, provided they do not constitute a barrier to wildlife movement; a sketch

or survey of the property showing the proposed fence location must accompany the application.

- c. Vista pruning of shrubs and trees according to the following guidelines . . . [See *Falmouth's for detailed parameters*]?
 - d. Removal of invasive species by hand on the ____ list within the Buffer Zone and Adjacent Upland Resource Area provided native plants from the ____ list are planted in the same area provided erosion and sedimentation controls are implemented during construction are implemented during work.
 - e. Planting of native species of trees, shrubs, or groundcover that are on the ____ list, but excluding planting or expansion of lawn area.
 - f. the conversion of impervious surface to vegetated area, provided erosion and sedimentation controls are implemented during construction;
 - g. Activities that are temporary in nature, having negligible impacts, and are necessary for planning and design purposes (e.g., installation of monitoring wells, exploratory borings, sediment sampling, and surveying); a sketch or survey of the property showing the proposed locations and resource areas must accompany the application.
 - h. Pervious walkways of no more than 30 inches in width as long as no trees or shrubs will be removed;
- C. Procedure:
- a. The Applicant shall complete and submit a Form ____ [*create form and name it*] that shall contain sufficient information to determine where the project or work is proposed and whether it meets the requirements set forth in this section.
 - b. The Applicant must provide a complete written description of all the work proposed and protective or mitigation measures proposed
 - c. The Conservation Agent shall visit the site and the boundaries of Resource Areas must be clearly evident to the Conservation Agent;
 - d. The Conservation Agent shall determine whether the project or work meets the criteria listed in Section __ (B) above.
 - e. The Conservation Agent shall issue an Administrative Review Decision (Form ____) within 7?? days of receipt of Form ____ that fulfills the information requirements of this section.

Comment [e2]: PH wonders why we can't just use the language of Wetland Protection Act in 10.02 (2)(b)2c here.

- f. The Conservation Agent may approve the work as proposed, approve it with conditions, or deny the work.
- g. The decision will be filed with the Commission and a copy provided to the Applicant.

[Discussion point: do we want the Commission to be able to appeal to itself/reverse decision?]

D. Appeal

The decision rendered by the Conservation Agent may be appealed by the person seeking Administrative Review by filing a Request for Determination of Applicability. *[Do we want the following?]* Any person aggrieved by a decision rendered by the Conservation Commission under this Section may file an RDA with the Commission within ??? days.

E. x



Town of Arlington, Massachusetts

Notice of Intent: 869 Massachusetts Ave

Summary:

Notice of Intent: 869 Massachusetts Ave, Arlington High School
MassDEP File #091-0323

This Notice of Intent (NOI) has not yet been presented to the Conservation Commission, and this meeting is the first opportunity for public comment. It is strongly encouraged that members of the public submit written comment for this NOI to the Conservation Agent in advance of the hearing, by emailing Emily Sullivan at esullivan@town.arlington.ma.us. All materials submitted for this NOI can be found on the Commission's agenda and minutes page, under the agenda for the 05/21/2020 meeting.

Hearing Summary:

The proposed project includes razing the existing high school and constructing a new high school with associated new paved parking areas, landscaping, athletic fields, bathroom building, utilities, and a new stormwater management system in accordance with the Massachusetts DEP Stormwater Standards. The existing football stadium will remain as is and is not included within the scope of this project.

ATTACHMENTS:

Type	File Name	Description
▣ Notice of Intent	AHS_NOI.pdf	869 Mass Ave NOI
▣ Notice of Intent	AHS_Existing_Conditions_Plan_Set.pdf	869 Mass Ave NOI Existing Conditions Plan Set
▣ Notice of Intent	AHS_NOI_Civil_Engineering_Plan_Set_compressed.pdf	869 Mass Ave NOI Civil Engineering Plan Set
▣ Notice of Intent	AHS_Sports_Field_Plan_Set.pdf	869 Mass Ave NOI Sports Fields Plan Set
▣ Notice of Intent	AHS_Stormwater_Report.pdf	869 Mass Ave NOI Stormwater Report

ARLINGTON HIGH SCHOOL
869 MASSACHUSETTS AVENUE
ARLINGTON, MA 02476

NOTICE OF INTENT

*Pursuant to M.G.L. c. 131 §40
& Arlington Bylaws Article*



Submitted to:
Town of Arlington Conservation Commission &
Massachusetts Department of Environmental Protection

Applicant:
Adanm Chapdelain
Town of Arlington
730 Mass. Ave. Annex
Arlington, MA 02476

Architect:
HMFH Architects
130 Bishop Allen Drive
Boston, MA 02139

Civil Engineer:
Samiotes Consultants, Inc.
20 A Street
Framingham, MA 01701

samiotes



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

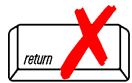
Document Transaction Number

Arlington

City/Town

Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

869 Massachusetts Ave

a. Street Address

Arlington

b. City/Town

02476

c. Zip Code

Latitude and Longitude:

42.418739

d. Latitude

-71.161348

e. Longitude

53-2-4

f. Assessors Map/Plat Number

g. Parcel /Lot Number

2. Applicant:

Adam

a. First Name

Chapdelaine

b. Last Name

Town of Arlington

c. Organization

730 Mass. Ave. Annex

d. Street Address

Arlington

e. City/Town

MA

f. State

02476

g. Zip Code

781 316-3010

h. Phone Number

716 316-3019

i. Fax Number

achapdelaine@town.arlington.ma.us

j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Stephen

a. First Name

Garvin, PE

b. Last Name

Samiotes Consultants

c. Company

20 A Street

d. Street Address

Framingham

e. City/Town

MA

f. State

01701

g. Zip Code

508 877-6688 x 13

h. Phone Number

508 877-8349

i. Fax Number

sgarvin@samiotes.com

j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

\$0

a. Total Fee Paid

\$0

b. State Fee Paid

\$0

c. City/Town Fee Paid



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

A. General Information (continued)

6. General Project Description:

See attached narrative.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- | | |
|---|---|
| 1. <input type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Commercial/Industrial | 4. <input type="checkbox"/> Dock/Pier |
| 5. <input type="checkbox"/> Utilities | 6. <input type="checkbox"/> Coastal engineering Structure |
| 7. <input type="checkbox"/> Agriculture (e.g., cranberries, forestry) | 8. <input type="checkbox"/> Transportation |
| 9. <input checked="" type="checkbox"/> Other | |

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR 10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

South Middlesex

a. County

3886, 5371, 5380, 5399, 5408, 5450, 8136,
12709, 12917

b. Certificate # (if registered land)

285-292, 352, 108, 283, 483, 411, 360, 513, 529

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- ☒ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



Massachusetts Department of Environmental Protection
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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Bank	1. linear feet	2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input type="checkbox"/> Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	Mill Brook 1. Name of Waterway (if available) - specify coastal or inland	

2. Width of Riverfront Area (check one):

- ☐ 25 ft. - Designated Densely Developed Areas only
- ☐ 100 ft. - New agricultural projects only
- ☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 34,667 sf (20,275 sf previously degraded)

4. Proposed alteration of the Riverfront Area:

Total = 4,937	100' = 18,863 sf (17,093 sf previously degraded)	100'-200' = 6,221 sf (3,053 sf previously degraded)
a. total square feet		

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet _____ 2. cubic yards dredged _____	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet _____	2. cubic yards beach nourishment _____
e. <input type="checkbox"/> Coastal Dunes	1. square feet _____	2. cubic yards dune nourishment _____
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	1. linear feet _____	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet _____	
h. <input type="checkbox"/> Salt Marshes	1. square feet _____	2. sq ft restoration, rehab., creation _____
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet _____	
	2. cubic yards dredged _____	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet _____	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged _____	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	1. square feet _____	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW _____

b. square feet of Salt Marsh _____

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings _____

b. number of replacement stream crossings _____



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C. Other Applicable Standards and Requirements

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

**Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581**

b. Date of map _____

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area

_____ percentage/acreage

(b) outside Resource Area

_____ percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☒ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☒ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



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C. Other Applicable Standards and Requirements (cont'd)

- (c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

- (d) ☐ Vegetation cover type map of site
- (e) ☐ Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

- a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.



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City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users:

Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
- a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
- a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
- a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
- a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
 2. ☐ A portion of the site constitutes redevelopment
 3. ☒ Proprietary BMPs are included in the Stormwater Management System.
- b. ☐ No. Check why the project is exempt:
1. ☐ Single-family house
 2. ☐ Emergency road repair
 3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



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D. Additional Information (cont'd)

3. ☐ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☐ List the titles and dates for all plans and other materials submitted with this NOI.

See attached Drawing List

a. Plan Title

Samiotes Consultants, Inc

b. Prepared By

Stephen Garvin, PE

c. Signed and Stamped by

Varies

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☒ Attach NOI Wetland Fee Transmittal Form
9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

Fee Exempt

2. Municipal Check Number

Fee Exempt

4. State Check Number

Fee Exempt

6. Payor name on check: First Name

Fee Exempt

3. Check date

Fee Exempt

5. Check date

Fee Exempt

7. Payor name on check: Last Name



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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

May 4, 2020

1. Signature of Applicant

2. Date

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

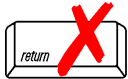
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

869 Massachusetts Ave

a. Street Address

Arlington

b. City/Town

Exempt

Exempt

c. Check number

d. Fee amount

2. Applicant Mailing Address:

Adam

a. First Name

Chapdelaine

b. Last Name

Town of Arlington

c. Organization

730 Massachusetts Ave. Annex

d. Mailing Address

Arlington

e. City/Town

MA

f. State

02476

g. Zip Code

781 316-3010

h. Phone Number

781 316-3019

i. Fax Number

achapdelaine@town.arlington.ma.us

j. Email Address

3. Property Owner (if different):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).



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NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
MSBA Funded H.S.			

Step 5/Total Project Fee: _____

Step 6/Fee Payments:

Total Project Fee:	\$0
	a. Total Fee from Step 5
State share of filing Fee:	\$0
	b. 1/2 Total Fee less \$12.50
City/Town share of filing Fee:	\$0
	c. 1/2 Total Fee plus \$12.50

C. Submittal Requirements

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

ARLINGTON HIGH SCHOOL PROJECT NARRATIVE ARLINGTON, MA

1.0 Introduction

The existing site, located at 869 Massachusetts Avenue, Arlington, MA, consists of the Arlington High School campus, containing the existing Arlington High School Building with an associated paved driveways, landscaped areas, and utilities as well as grass athletic fields, turf football field and facilities. There are several accessory structures across the property for equipment storage and bathroom facilities for the fields. The property is abutted by the Minuteman Commuter Bikeway on the north side, a condominium complex and pharmacy on the east side, and a series of residences and the Francis N. O'Hara building on the west side. The site slopes approximately 33 feet from south to north, with the high point of the site being at Massachusetts Ave., with the low point being on the east side of the site at the end of the Mill Brook culvert. Mill Brook flows through the site from west to east between the existing building and the football stadium via a subsurface concrete box culvert. which splits into two corrugated metal culverts on the east side of the existing building before daylighting on the east side of the site adjacent to Mill Street Drive.

The proposed project includes a new 143,025 square foot High School building footprint with associated new paved parking areas, landscaping, athletic fields, bathroom building, utilities and a new stormwater management system in accordance with the Massachusetts DEP Stormwater Standards. The existing football stadium will remain as is and is not included within the scope of this project.

1.1 Existing Conditions

The parcel for the Arlington High School is approximately $21.18 \pm$ acres in size, Existing Conditions Plan Sheet EX1.1 – EX1.6 shows the entire site including the land use, topographic features, and identified resources areas. The project site is bounded to the north by a wooded area and the Minuteman Commuter Bikeway. To the east there is residential condominium development, a CVS Pharmacy and Mill Brook Drive. To the south of the project is Massachusetts Avenue. To the west of the project are residential buildings along Schuler Court and the Arlington Department of Public Works.

Plans C-1.0 – C-4.4 show the entire site including land use, topographic features, and identified resource areas.

1.2 Regional Context

Land use surrounding the property predominantly consists of commercial buildings and multi-family residential apartment buildings. Site Locus Plan Sketch in the Appendix depicts the context of the area in relation to the neighborhood.

1.3 Resource Areas

Wetland resources subject to jurisdiction under the Massachusetts Wetlands Protection Act and the Town of Arlington Wetlands Protection Bylaw were delineated by Epsilon Associates on July 15, 2019.

A summary of wetland resource areas is provided below and is included in the Appendix.

Riverfront Area:

Flags AB-1 to AB-15 and AB-111 to AB-115 delineate the Mean Annual High Water (MAHW) line of Mill Brook which flows away from the property to the east parallel to Mill Brook Drive. The stream is indicated as perennial, and is therefore presumed under 310 CMR 10.58 and the Arlington Wetlands Bylaw to contain a 200-foot Riverfront Area extending horizontally from the limits of MAHW.

Flag AB-15 and AB-115 are located west of the baseball field where Mill Brook is daylighted between two 6-foot wide concrete box culverts and approximately 5-feet downstream Mill Brook enters the project site before being culverted beneath the school facility. Approximately 1,000 feet downstream are flags AB-13 and AB-113 where Mill Brook daylightes again through a concrete reinforced double corrugated plastic culvert. Approximately 200 feet downstream are flags AB-1 and AB-101 where Mill Brook flows under a 15-foot wide concrete bridge. The stream channel contains well defined and vegetated bank, separated from the project site by a chain link fence. MAHW was determined based upon bankfull indicators, including changes in slope, undercut banks and clear changes in vegetation from primarily aquatic to primarily terrestrial.

Riverfront Area regulations contained within 310 CMR 10.58 generally require a 100-foot zone of natural undisturbed vegetation unless this area has been previously developed or degraded, such as by filling, paving or construction of other structures. Construction proposed in the Riverfront Area must also demonstrate that there are no other alternatives with lesser impact to the river. New alterations of Riverfront Area must be under 5,000 square feet or 10% of the total Riverfront Area on the parcel, whichever is greater. In the case of proposed redevelopment of previously degraded areas, alterations must not exceed that of the total degraded area.

Inland Bank

The limits of Inland Bank resource associated with Mill Brook was determined to be coincident with the limit of MAHW defining Riverfront Area as described above. The top of Bank is defined under state and local regulations as the first observable break in slope above the water, or mean high water, whichever is lower. The bank at the project site generally consists of 1-2 foot high steep or nearly vertical slope vegetated with small trees and shrubs. The top of the Bank is at a clear break in slope above the water.

There is a 100-foot Buffer Zone associated with Inland Banks under state and local regulations.

Bordering Vegetated Wetland (BVW):

Flag series AB-1 to AB-13 and AB-101 to AB-113 delineates the limits of a BVW extending from the brooks described above. Vegetation along the banks consisted of honey locust (*Gleditsia triacanthos*), black willow (*Salix nigra*), Norway maple (*Acer platanoides*), white oak (*Quercus alba*), silver maple (*Acer saccharinum*), white ash (*Fraxinus Americana*), slippery elm (*Ulmus rubra*), staghorn sumac (*Rhus typhina*), Japanese knotweed (*Reynoutria japonica*), glossy buckthorn (*Frangula alnus*), garlic mustard (*Alliaria petiolate*), and Asian bittersweet (*Celastrus orbiculatus*). The substrate consisted of pebbles and cobbles, which formed riffle pools. The water ran clear, at about four inches to two feet deep. The steep soil banks transitioned to rock wall between flags AB-11 to AB-13 on the southern bank. Mill Brook flowed east through a 15-foot wide concrete bridge between flags AB-1 and AB-101. A concrete

reinforced double corrugated plastic culvert was located between flags AB-113 and AB-13. A 12-inch concrete reinforced pipe was located between flags AB-4 and AB-5.

Bank Series AB-114 to AB-115 and AB-14 to AB-15 was delineated in the western portion of the Study Area. This portion of Mill Brook is daylighted between two 6-foot wide concrete box culverts. This portion of the stream has a concrete substrate, and 5-foot vertical concrete banks. At the time of delineation, 2-4 inches of running water was observed. Vegetation along the top of these banks was dominated by northern catalpa (*Catalpa speciosa*), Asian bittersweet, box elder, and garlic mustard.

Additional BVW is located in the southwest perimeter of the school property where two areas of wet meadow extend into mowed grass areas. These areas connect to wetlands and a small intermittent stream channel located off-site behind the residences on Brook Street. They were delineated by flags A-1 to A-5 and C-1 to C-9. Dominant vegetation includes rough-stem goldenrod (*Solidago rugosa*), purple loosestrife (*Lythrum salicaria*), spotted joe-pye weed (*Eupatoriadelphus maculatus*) and jewelweed (*Impatiens capensis*). Adjacent uplands consist of mowed lawn.

Bordering Land Subject to Flooding (BLSF):

The current Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Maps ("FIRM") dated 6/4/2010 Community Panel Numbers 0417E and 0416E for the Town of Arlington indicate that portions of the Study Area are located within the 100-year floodplain. The 100-year floodplain is regulated as BLSF under the local and state wetlands regulations. A regulatory floodway also covers a portion of Mill Brook to the east. The base flood elevation identified in the FEMA FIRM (elev. 42-feet) is shown on the existing and proposed conditions permit drawings to delineate the edge of BLSF.

1.5 Riverfront Alternatives

Alternative 1: Renovation Only

An alternative to the selected option is to renovate the existing School, along with additions to the existing school. This would not meet the criteria to allow for the District's educational vision for the school.

Alternative 2: Additions and Renovations

Another alternative to this project is to renovate portions of the existing school and add on additions to the structure. This would not meet the criteria for the District's educational vision for the school – leaving many critical elements of the educational plan unaddressed. These alternatives also leave the existing previously disturbed areas (parking, etc.) as is, thus not improving the Riverfront Area from its current condition.

Alternative 3: No Build

The proposed School would not be built in this scenario. This does not meet the program requirements for the school / district.

Additionally, during the MSBA feasibility study, the team investigated multiple layouts for suitable solutions for the site. It was determined through that study that the selected alternative best met the programmatic requirements while accommodating the physical constraints of the parcel (resource areas, size, shape, slopes, etc.).

1.6 Wildlife Habitats

The project site is **NOT** located within Priority Habitat or Estimated Habitat of Rare Wetlands Wildlife as determined by reference to data provided by the Mass. Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program (NHESP) available on MassGIS.

Included in the Appendix is a sketch depicting that the site is not within Priority Habitat or Estimated Habitat of Rare Wetlands Wildlife.

2.0 Project Description

The proposed project will consist of constructing a new school building off of the south face of the existing building and extending north into the footprint of the existing building.

Due to the proposed building location the existing driveway off of Mill Brook Drive will be realigned to provide a drop off area for parents/ students, a delivery entrance for trucks, and several parking spaces and handicapped parking spaces. The driveway will continue around the school and provide access to additional parking to the west and Massachusetts Ave. via Schuler Court. The athletic fields to the north and northwest shall be reconstructed with infill turf and provide accessible paths.

The Stormwater Report included with this submission (under separate cover) has a more in depth analysis of the hydrological function of the site.

3.0 Construction Impacts on areas subject to protection Under M.G.L. c. 131, § 40 and Town of Arlington Regulations for Wetlands Protection bylaw.

3.1 Inland Bank [310 CMR 10.54]

No activities are proposed within Inland bank.

3.2 Bordering Vegetated Wetlands [310 CMR 10.55]

Preamble:

Bordering Vegetated Wetlands are likely to be significant to public or private water supply, to ground water supply, to flood control, to storm damage prevention, to prevention of pollution, to the protection of fisheries and to wildlife habitat. The plants and soils of Bordering Vegetated Wetlands remove or detain sediments, nutrients (such as nitrogen and phosphorous) and toxic substances (such as heavy metal compounds) that occur in run-off and flood waters. The profusion of vegetation in Bordering Vegetated Wetlands acts to slow down and reduce the passage of flood waters during periods of peak flows by providing temporary flood water storage and by facilitating water removal through evaporation and transpiration. This process reduces downstream flood crests and resulting damage to private and public property. During dry periods the water retained in Bordering Vegetated Wetlands is essential to the maintenance of base flow levels in rivers and streams, which in turn is important to the protection of water quality and water supplies.

Performance Standard:

No work is proposed to the Bordering Vegetated Wetland (BVW).

3.3 Buffer Zones [310 CMR 10.02]

Preamble:

Extensive work in the inner portion of the buffer zone, particularly clearing of natural vegetation and soil disturbance is likely to alter the physical characteristics of resource areas by changing their soil composition, topography, hydrology, temperature, and the amount of light received. Soil and water chemistry within resource areas may be adversely affected by work in the buffer zone. Alterations to biological conditions in adjacent resource areas may include changes in plant community composition and structure, invertebrate and vertebrate biomass and species composition, and nutrient cycling. These alterations from work in the buffer zone can occur through the disruption and erosion of soil, loss of shading, reduction in nutrient inputs, and changes in litter and soil composition that filters runoff, serving to attenuate pollutants and sustain wildlife habitat within resource areas.

Performance Standards:

The wetland buffer zones consist of mixed uses; a portion of the area has been previously disturbed and contain portions of the paved driveway, paved parking lot, concrete slabs for bleachers, unpaved athletic field, granite curbing, and grassed areas.

Proposed buffer zone construction will include grading, demolition & removal of the existing pavement and curbs, repaving a new driveway and parking lot and construction of stormwater and other underground utilities. Work is not proposed to encroach closer within the buffer than what is currently disturbed.

To mitigate the potential for adverse impacts on the resource area caused by work in the buffer zones during construction, a detailed soil erosion and sediment control plan has also been established for all phases of construction.

3.4 Bordering Land Subject to Flooding (BLSF) [310 CMR 10.02(2)(b)3]

Preamble:

Flood Plains are documented by the Federal Emergency Management Agency (formerly the Department of Housing and Urban Development - Federal Insurance Administration) for the Town of Arlington (Middlesex County) on the Flood Insurance Rate Map Community Panel Number 25017C0417E, with an effective date of June 4, 2010. This plan is depicted in the Appendix.

The boundary of BLSF is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm. FEMA indicates that Mill Brook has been identified as a Zone AE. The base flood elevation identified in the FEMA Firm as the edge of the BLSF is 42-feet. According to FEMA flood mapping, the site is located within Zones X and AE (see FEMA Firmette Map within the appendices of this report). These flood zones are depicted graphically on the civil design plans and existing conditions plans per the FEMA delineation. However, after a field survey of elevations present at the site, we have concluded that the flood elevations shown on the FEMA mapping are held within the banks of the Mill Brook and do not encroach on the site. During the last major renovation at the school, there was a small area on the east side of the school dedicated for compensatory storage.

There is no buffer zone extending from this resource.

Performance Standards:

There is NO work occurring within Flood Zone AE per the actual elevations per the Flood Impact Study. There is a small compensatory storage area on the east side of the existing building that was for

a previous project but not defined by elevations or compensatory storage volumes. This area will be disturbed by the proposed High School project. The proposed project work, even though not within flood plain elevations as defined by FEMA or the WPA, will emulate the existing compensatory storage by providing compensatory storage within the stone of the turf fields that far exceed the volume held by the existing "Compensatory flood storage area".

3.5 Riverfront Area [310 CMR 10.58]:

Preamble:

Riverfront areas are likely to be significant to protect the private or public water supply; to protect groundwater; to provide flood control; to prevent storm damage; to prevent pollution; to protect land containing shellfish; to protect wildlife habitat; and to protect the fisheries. Land adjacent to rivers and streams can protect the natural integrity of these water bodies. The presence of natural vegetation within riverfront areas is critical to sustaining rivers as ecosystems and providing these public values. In those portions so extensively altered by human activity that their important wildlife habitat functions have been effectively eliminated, riverfront areas are not significant to the protection of important wildlife habitat and vernal pool habitat.

Performance Standards:

The proposed work within the 200-foot Riverfront Area is not located closer to the river than the existing disturbed area which extends well into the 100-foot Inner Riparian zone.

The site has a total Riverfront Area of 34,667 s.f, consisting of 20,275 s.f. previously degrade land. The proposed work will disturb a total of 4,937 s.f. of non-degraded Riverfront Area. For the Inner Riparian Zone there will be 1,570 s.f. of disturbance with 100 s.f. of additional restored area from the existing condition. Within the outer Riparian Zone, an additional 3,168 s.f. will be altered. Wildlife friendly plantings and "low mow" meadow style grasses will also be utilized to improve on the current mowed landscape condition of the Riverfront Areas in the existing condition.

3.6 Town of Arlington Regulations for Wetlands Protection Section 31 Climate Change Resiliency:

The project integrates considerations of adaptation planning into the project to promote climate change resilience so as to protect and promote resource area values in the future. The overall project will meet LEED guidelines and be LEED certified including significantly improving energy demands (including as an example the use of photovoltaics) when compared to the exiting school. Additionally, the stormwater management will now met State and local standards including such Low Impact Development BMP's as Rain Gardens and

4.0 Soil Erosion and Sediment Control Plan

The objectives of the Soil Erosion and Sediment Control Plan are to control erosion at its source during construction activities, by applying temporary control structures, minimizing the runoff from areas of disturbance, and de-concentrating and distributing stormwater runoff through natural vegetation before discharging to critical zones such as streams or wetlands. Soil erosion control does not begin with the perimeter sediment trap. It begins at the source of the sediment the disturbed land areas, and extends down to the control structure.

The Soil Erosion and Sediment Control Plan will be enacted in order to protect the resource areas during construction. The erosion control devices will remain in place until all exposed areas have been stabilized with vegetation or impervious surfaces.

The objective of the Soil Erosion & Sediment Control Plan that will be enacted on site is to control the vulnerability of the soil to the erosion process or the capability of moving water to detach soil particles during the construction phase(s).

- A. The Contractor shall submit a copy of the SWPPP and accompanying erosion and sediment control plan prior to commencing work.
- B. The Contractor shall implement all soil erosion and sediment control devices prior to excavation within the site.
- C. The following erosion control principles shall apply to the land grading and construction phases:
 - Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.
 - Whenever feasible, natural vegetation shall be retained and protected.
 - Extent of area which is exposed and free of vegetation and duration of its exposure shall be kept within practical limits.
 - Temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during prolonged construction or other land disturbance.
 - Sediment shall be retained on-site.
 - Erosion control devices shall be installed as early as possible in the construction sequence prior to the start of grubbing and earthwork operations and excavation work.

4.1 Erosion Control Devices

1. Straw Wattles

Straw bales for construction of erosion control devices shall be new, firm, wire or nylon-bound livestock feed grade. The netting shall have a strand thickness of 0.03 inch, and a knot thickness of 0.055 and a weight of 0.35 ounce per foot (each +/- 10%) and shall be made from 85% high density polyethylene, 14% ethyl vinyl acetate and 1% color for UV inhibition. Straw Wattles shall be 9 inches in diameter (+/- one inch), twenty-five feet long (+/- 0.5 feet) and weigh approximately 35 pounds (+/- 10%).

Wattles shall be installed along the edge of resource areas adjacent to the proposed work. Wattles shall also be placed around the toe of stockpiles and at locations where grading is performed.

Installation and Maintenance

- a. Wattles shall be installed as indicated on the drawing, prior to the start of grubbing and earthwork operations.
- b. Wattles shall be new and shall be secured in place as shown on the plans.

- c. Wattles shall be placed in a row with ends tightly abutting the adjacent wattles. Each wattles shall be securely anchored in place by 2 stakes or re-bars driven through the wattles. The first stake in each wattle shall be angled toward the previously laid wattles to force the wattles together
- d. Sedimentation shall be removed from wattles barrier when sediment has accumulated to greater than 6 inches deep. Sediment deposits shall be disposed of in accordance with the SWPPP.
- e. Wattles barrier(s) shall be inspected periodically and deteriorated wattles replaced until such time as construction is completed and exposed slopes have been stabilized.
- f. Wattles barrier shall remain in place until exposed soils have been stabilized with a vegetative cover.
- g. Wattles shall not be removed until approval is given by the Commission.

2. Siltation Fence

Geotextile Fabric shall consist of long-chain synthetic polymers, composed of at least 85% by weight polyolefins, polyesters, or polyamides. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including selvages. The geotextile fabric shall have the following properties:

Property(ASTM Test Method)	Unit	Typical Values
Grab Strength (D-4632-86)	lbs	100
Grab Elongation (D-4632-86)	%	30(Max)
Trapezoid Tear Strength (D-4533-85)	lbs	65
Mullen Burst Strength (D-3786-80a)	psi	280
Coeff. of Permeability (D-4491-85)	cm/sec	0.01
Water Flow Rate (D-4491-85)	gal/min/(ft)(ft)	35
Ultraviolet Stability (D-4355-84)	%	90

Support fence posts shall be at least 48 inches high and strong enough to support applied loads. The Contractor shall have the option of using wood or metal posts. Wood posts shall consist of 1 1/2" square, kiln dried, hardwood posts. Steel posts of U, T, L, or C shape weighing 1.3 pounds per linear foot may be substituted for wood. Filter fabric shall be attached to wood posts with staples and with 13 gage minimum, galvanized steel wire for steel post application.

Installation and Maintenance

- a. Silt Fence shall be installed as indicated on the drawing, prior to the start of grubbing and earthwork operations.
- b. The location of silt fence shall be reviewed and approved by the Commission.
- c. Accumulation of siltation behind the fence shall be removed once the total depth of silt reaches 6".

Silt fence shall remain in place until directed to be removed by the Commission.

Areas disturbed after removal shall be regraded and seeded.

3. Catch Basin Filters

The filters will be manufactured to fit the opening of the catch basins, drywells, and Treepit inlets. The filters will have the following features:

- Two dump straps attached at the bottom to facilitate the emptying of the filters.
- The filters will also have lifting loops as an integral part of the system to be used to lift the filters from the basin.
- The filters will have a restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls; this yellow cord shall also be a visual means of indicating when the sack should be emptied.
- Filters shall be removed once paving is completed but not prior to installation of oil hoods. Filters in landscaped areas (or subject to runoff from landscaped areas) shall remain until vegetation is established.

Installation and Maintenance

- a. Silt sacks or approved equal shall be installed where shown on the plans.
- b. Silt sacks or approved equal shall be installed in all new drain lets as soon as the structure is installed.
- c. Once the strap is covered the filter shall be emptied, cleaned and reinstalled.

4. Construction Entrance

The construction entrance shall consist of filter fabric, a layer of clean, crushed stone, ranging from 1-1/2" to 2-1/2" in size, and a top dressing of clean 2" crushed stone. Geotextile Fabric shall consist of long-chain synthetic polymers, composed of at least 85% by weight polyolefins, polyesters, or polyimides. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including selvages. The geotextile fabric shall have the following properties:

<u>Property (ASTM Test Method)</u>	<u>Unit</u>	<u>Typical Values</u>
Grab Strength (D-4632-86)	lbs	100
Grab Elongation (D-4632-86)	%	30 (Max)
Trapezoid Tear Strength (D-4533-85)	lbs	65
Mullen Burst Strength (D-3786-80a)	psi	280
Coeff. of Permeability (D-4491-85)	cm/sec	0.01
Water Flow Rate (D-4491-85)	gal/min/(ft)(ft)	35
Ultraviolet Stability (D-4355-84)	%	90

5. Dust Control

Water will be applied by sprinkler or water truck as necessary during grading operations in order to minimize sediment transport and maintain acceptable air quality conditions. Repetitive treatments will be done as needed until the grades are paved or seeded.

6. Temporary seed cover

Grass seed for temporary seed cover shall be the previous year's crop. Not more than 0.1% by weight shall be weed seed and not more than 1.75% by weight shall be crop seed. Seed shall be delivered to

the site in sealed containers, labeled with name of seed grower and seed formula, in form stated below. Seed shall be dry and free of mold. Seed shall meet the following requirements:

Species Name	% by Weight	Minimum % in Mixture	Minimum % Germination Purity
Chewing Fescue (Festuca Rubra Comutata)	25	85	97
Alta Fescue (Festuca Arundinacea)	30	85	97
Annual Rye Grass (Lolium Multiflorum)	20	90	98
Red Top (Agrostis Alba)	15	90	92
White Clover (Trifolium Repens)	10	90	98

Installation

- At the Contractor's option, seed may be spread by the hydro-seeding method, utilizing power equipment commonly used for that purpose. Seed and mulch shall be mixed and applied to achieve application quantities specified herein for the conventional seeding method, with mulch applied at the rate of 2700 lb. dry weight of mulch per acre. A mulching machine, acceptable to the Civil Engineer, shall be equipped to eject the thoroughly wet mulch material at a uniform rate to provide the mulch coverage specified.
- If the results of hydro-seeding are unsatisfactory, the mixture and/or application rates and methods shall be modified to achieve the desired results.
- After the grass has appeared, all areas and parts of areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be re-seeded repeatedly if necessary, until all areas are covered with a satisfactory growth of grass.
- If seeding cannot be established due to weather conditions, jute mesh shall be placed on the surface to reduce soil erosion.

7. Jute Mesh

Jute mesh shall be a uniform, open, plain weave cloth of undyed and unbleached single jute yarn. The yarn shall be of a loosely twisted construction and it shall not vary in thickness more than one-half its normal diameter. Jute mesh shall be furnished in rolled strips and shall meet the following requirements:

- Width - 48 inches, plus or minus one inch
- 78 warp - ends per width of cloth (minimum)
- 41 weft - ends per yard (minimum)
- Weight shall average 1.22 pounds per linear yard with a tolerance of plus or minus 5%.

Mesh shall be secure using U-shaped staples.

TABLE OF APPENDICES

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ABUTTER NOTIFICATION LETTER
CERTIFIED ABUTTERS LIST

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SKETCHES

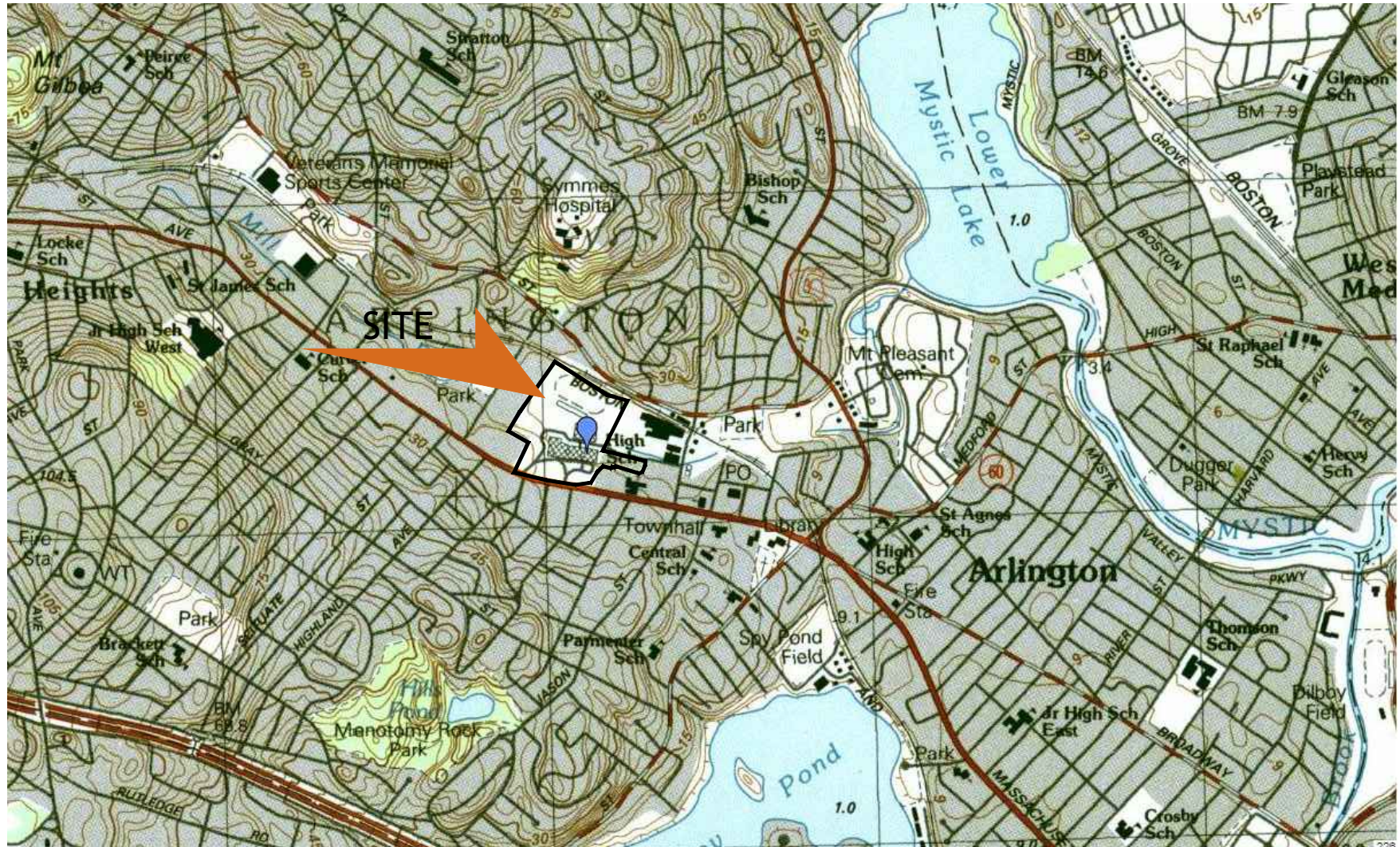
APPENDIX 3:
WETLANDS REPORT

APPENDIX 4:
DRAWING LIST

APPENDIX 1:
ABUTTER NOTIFICATION LETTER
CERTIFIED ABUTTERS LIST

APPENDIX 2:

SKETCHES



Sketch No. NOI-1
Reference Drawing -

Job #:	17211.00
Drawn by:	DJS
Scale:	As Shown
Date:	05/05/20

Project: ARLINGTON HIGH SCHOOL

Title: LOCUS MAP

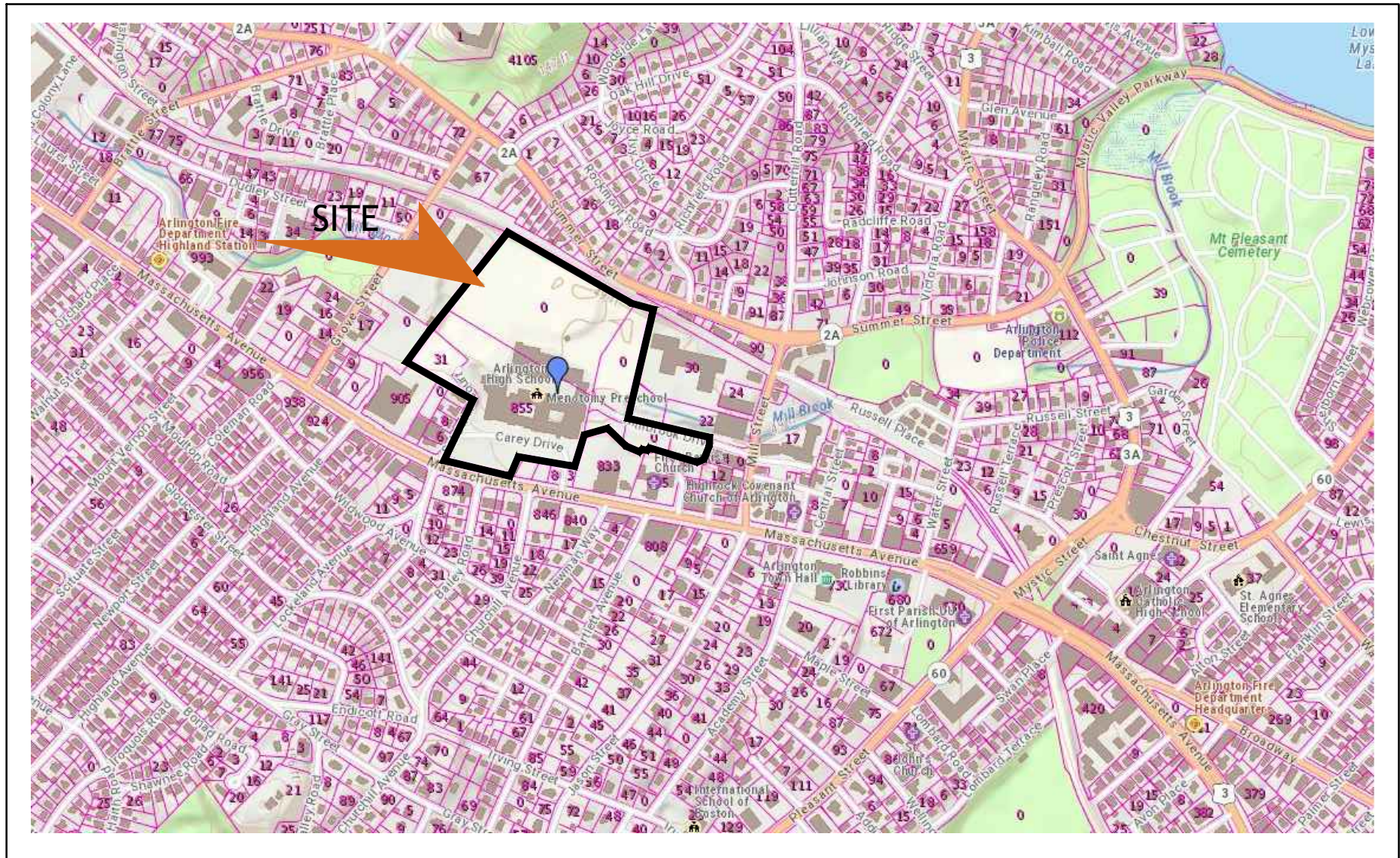
Samiotes Consultants Inc.
Civil Engineers + Land Surveyors

20 A Street
Framingham, MA 01701

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F 508.877.8349

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Sketch No.

NOI-2

Reference Drawing

-

Job #: 17211.00

Drawn by: DJS

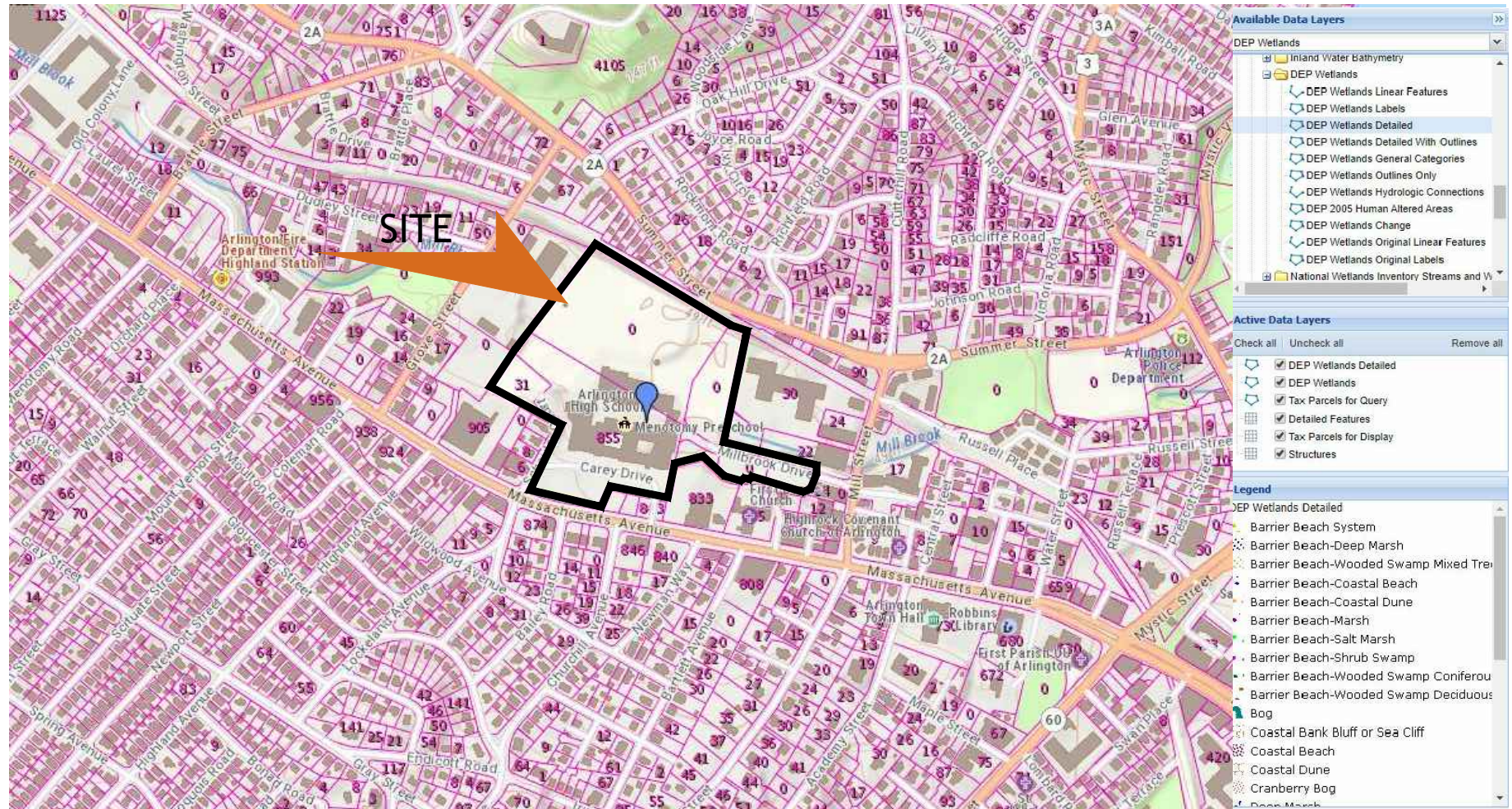
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Date: 05/05/20

Project: ARLINGTON HIGH SCHOOLTitle: NHESP MAPSamiotes Consultants Inc.
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Sketch No.
NOI-3

Reference Drawing
-

Job #: 17211.00

Drawn by: DJS

Scale: As Shown

Date: 05/05/20

Project: ARLINGTON HIGH SCHOOL

Title: RESOURCE AREA MAP

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Sketch No.
NOI-4

Reference Drawing
-

Job #: 17211.00

Drawn by: DJS

Scale: As Shown

Date: 05/05/20

Project: ARLINGTON HIGH SCHOOL

Title: Zone I, Zone II, Zone A
Zone B, Zone C, IWPAs

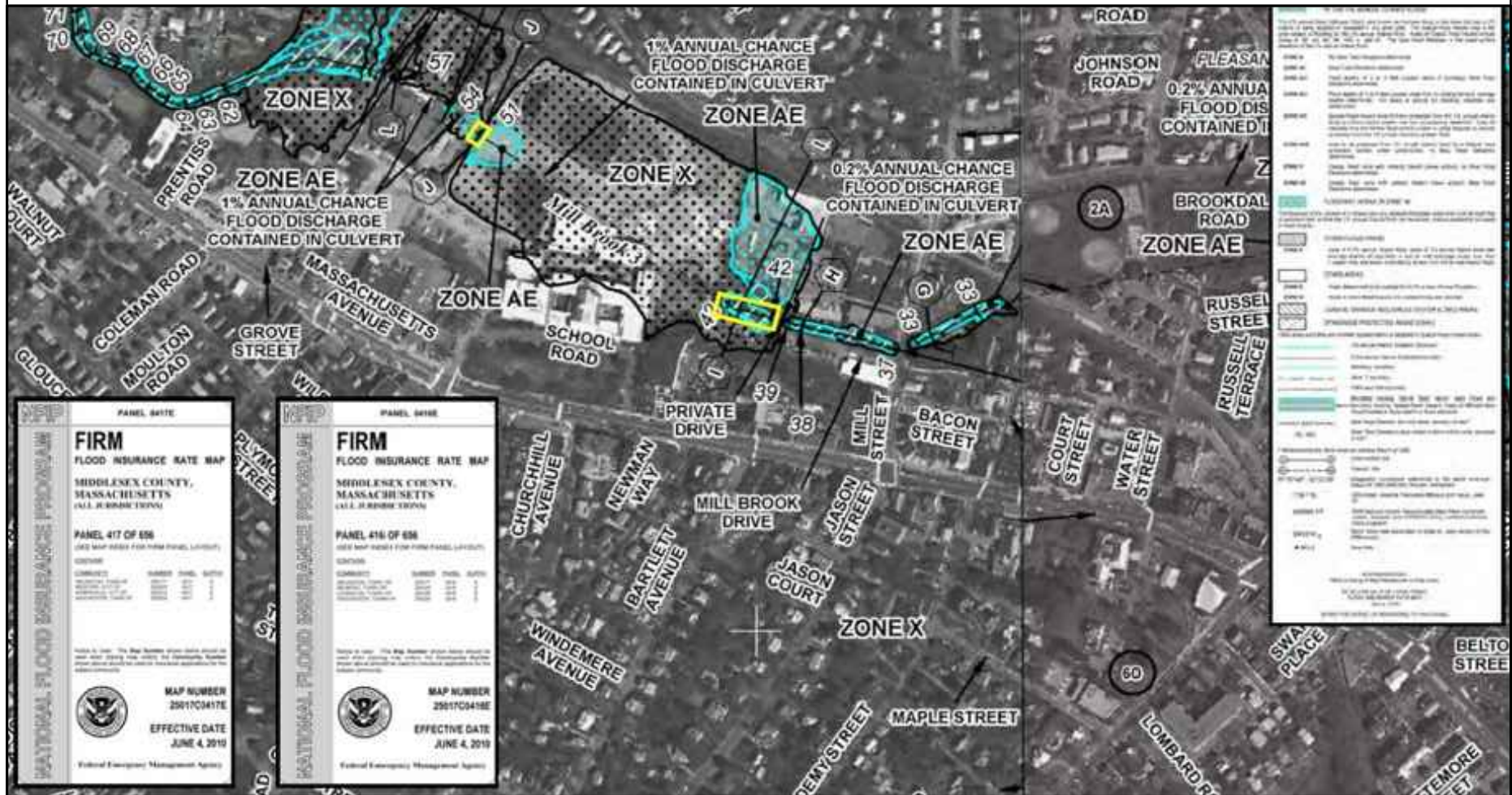
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Sketch No.
NOI-5

Reference Drawing
-

Job #: 17211.00

Drawn by: DJS

Scale: As Shown

Date: 05/05/20

Project: ARLINGTON HIGH SCHOOL

Title: TOPOGRAPHIC LOCUS MAP

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PICTURE 1: CULVERT HEADWALL EAST SIDE OF SITE



PICTURE 2: CULVERT HEADWALL EAST SIDE OF SITE



PICTURE 3: CULVERT HEADWALL WEST SIDE OF SITE



PICTURE 4: EXISTING DEPRESSION (HISTRORICAL COMPENSATORY STORAGE)



PICTURE 5: TOP OF HEADWALL EAST SIDE OF SITE



PICTURE 6: WETLAND RESOURCE AREA EAST PARKING LOT ALONG MILL BROOK



PICTURE 7: WETLAND RESOURCE AREA EAST PARKING LOT ALONG MILL BROOK



PICTURE 8: WETLAND RESOURCE AREA EAST PARKING LOT



PICTURE 9: MILL BROOK AT EAST HEADWALL



PICTURE 10: BRIDGE OVER MILL BROOK AT CONDOMINIUMS

APPENDIX 3:
WETLANDS REPORT

MEMORANDUM

Date: July 24, 2019

To: Mr. Stephen Garvin, P.E., President
Samiotes Consultants, Inc.

From: Amanda Atwell and Carolyn Gorss, Epsilon Associates Inc.

Subject: Wetland Delineation Memo: Arlington High School. Arlington, MA.

Overview

Epsilon Associates, Inc. (“Epsilon”) prepared this memo for Samiotes Consultants, Inc. for wetland resource areas delineated on a portion of Arlington High School, located off Mill Brook Drive in Arlington, MA (the “Study Area”). This report describes the resource areas delineated by Epsilon on July 15, 2019. The wetland sketch provided in Attachment C depicts the approximate locations of the delineated wetland resource areas by Epsilon, to be survey-located by Samiotes.

As described in further detail below, wetland resource areas identified by Epsilon within the Study Area include Bordering Land Subject to Flooding (“BLSF”), Inland Bank (“Bank”), Land Under Water (“LUW”) and Riverfront Area (“RFA”) associated with Mill Brook, a USGS mapped perennial stream.

Existing Site Conditions

The Study Area consists of the Arlington High school campus in Arlington, MA, where Mill Brook intersects the athletic fields, depicted in Figures 1, 2 and 5 of Attachment A. Mill Brook is a perennial stream that is culverted underneath several of the Arlington High School athletic fields, including a turf field, softball field, and soccer pitch. Mill Brook daylight in the eastern & western portions of the property. The Study Area is bordered to the west by the Arlington Inspectional Services Department, and to the east by apartment buildings, Mill Brook Drive, and parking lots. The northern edge of the Study Area is bordered by steep upland slopes leading to the Minuteman Commuter Bikeway. Academic buildings are located in the southern portion of the Study Area, bordered by Massachusetts Avenue.

Mill Brook flows away from the property to the east under a 15-foot wide concrete bridge, parallel to Mill Brook Drive. The stream is described in more detail below. The site photographs in Attachment B depict existing conditions within the Study Area at the time of delineation.

The current Federal Emergency Management Agency (“FEMA”) Flood Insurance Rate Maps (“FIRM”) dated 6/4/2010 Community Panel Numbers 0417E and 0416E for the Town of Arlington indicate that portions of the Study Area are located within the 100-year floodplain (see Attachment A, Figure 4). The 100-year floodplain is regulated as BLSF under the local and state wetlands regulations. A regulatory floodway also covers a portion of Mill Brook to the east. The base flood elevation identified in the FEMA FIRM (elev. 42-feet) should be added to the existing and proposed conditions permit drawings to delineate the edge of BLSF.

According to the Natural Heritage and Endangered Species Program (Natural Heritage Atlas, 2017), there are no mapped Priority and Estimated Habitats within the Study Area.

Wetland Delineation Methodology

Wetland resource areas were delineated in the Study Area by Epsilon on July 15, 2019. The banks of Mill Brook, Series AB, were delineated using visible markings or changes in the character of soils or vegetation due to the prolonged presence of water, as defined in 310 CMR 10.58(2), 310 CMR 10.54(2), and the Town of Arlington Bylaw’s definition of “Bank” in Section 9C of Article 8. More specifically, the upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level. The Mean Annual High Water (“MAHW”) of a perennial stream is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. The first observable break in slope is typically coincident with the MAHW line. Land Under Water Bodies is assumed to be contained below Inland Bank and within the approximate mean low water levels in the stream.

Wetland Resource Areas - Definitions

In addition to BLSF described above, the following wetland resource areas were delineated in the field:

Land Under Water:

According to 310 CMR 10.56, LUW is the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock. The boundary of Land Under Water Bodies and Waterways is the mean annual low water level. LUW is likely to be significant to public and private water supply, to ground water supply, to flood control, to storm damage prevention, to prevention of pollution and to protection of fisheries and wildlife habitat. Where such land is composed

of concrete, asphalt or other artificial impervious material, said land is likely to be significant to flood control and storm damage prevention.

Land Under Water within the Project Area is associated with Mill Brook, a perennial stream.

Inland Bank:

According to 310 CMR 10.54, an Inland Bank ("Bank") is the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and upland. The upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level. Banks are likely to be significant to public or private water supply, to ground water supply, to flood control, to storm damage prevention, to the prevention of pollution and to the protection of fisheries and wildlife habitat. Where Banks are composed of concrete, asphalt or other artificial impervious material, said Banks are likely to be significant to flood control and storm damage prevention. There is a 100-foot Buffer Zone associated with Inland.

Inland Bank in the Study Area is associated with Mill Brook. The wetland sketch in Attachment C depicts the locations of flags delineating the banks of the daylighted portions of Mill Brook.

Riverfront Area:

According to 310 CMR 10.58, a Riverfront Area is the area of land between a river's mean annual high water line and a parallel line measured horizontally. The riverfront area may include or overlap other resource areas or their buffer zones. The riverfront area does not have a buffer zone. Riverfront areas are likely to be significant to protect the private or public water supply; to protect groundwater; to provide flood control; to prevent storm damage; to prevent pollution; to protect land containing shellfish; to protect wildlife habitat; and to protect the fisheries. The RFA extends 200 feet horizontally from the mean annual high water line of Mill Brook. It does not extend from the portion of the river that is culverted beneath the school facility (meaning, it is only associated with the stretch of river that is daylighted).

Wetland Resource Areas

Epsilon delineated two sections of Bank associated with Mill Brook within the Study Area. Bank Series AB-1 to AB-13 and AB-101 to AB-113 was located in the eastern portion of the Study Area, parallel to Mill Brook Drive. Vegetation along the banks consisted of honey locust (*Gleditsia triacanthos*), black willow (*Salix nigra*), Norway maple (*Acer platanoides*), white oak (*Quercus alba*), silver maple (*Acer saccharinum*), white ash (*Fraxinus Americana*), slippery elm (*Ulmus rubra*), staghorn sumac (*Rhus typhina*), Japanese knotweed (*Reynoutria japonica*), glossy buckthorn (*Frangula alnus*), garlic mustard (*Alliaria petiolate*), and Asian bittersweet (*Celastrus orbiculatus*). The substrate consisted of pebbles and cobbles, which formed riffle pools. The water ran clear, at about four inches to two feet deep. The steep soil banks transitioned

to rock wall between flags AB-11 to AB-13 on the southern bank. Mill Brook flowed east through a 15-foot wide concrete bridge between flags AB-1 and AB-101. A concrete reinforced double corrugated plastic culvert was located between flags AB-113 and AB-13. A 12-inch concrete reinforced pipe was located between flags AB-4 and AB-5.

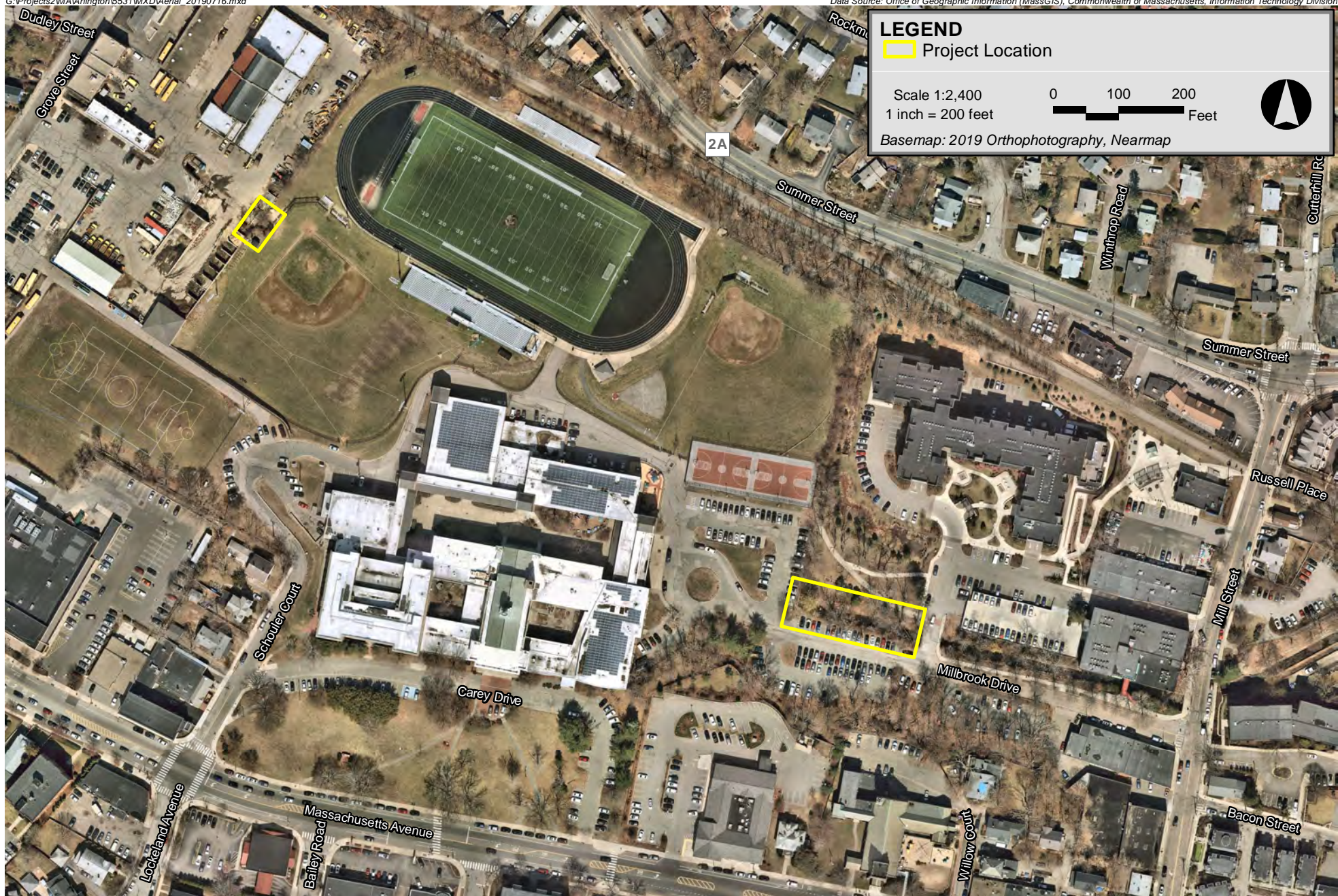
Bank Series AB-114 to AB-115 and AB-14 to AB-15 was delineated in the western portion of the Study Area. This portion of Mill Brook is daylighted between two 6-foot wide concrete box culverts. This portion of the stream has a concrete substrate, and 5-foot vertical concrete banks. At the time of delineation, 2-4 inches of running water was observed. Vegetation along the top of these banks was dominated by northern catalpa (*Catalpa speciosa*), Asian bittersweet, box elder, and garlic mustard.

Attachment A

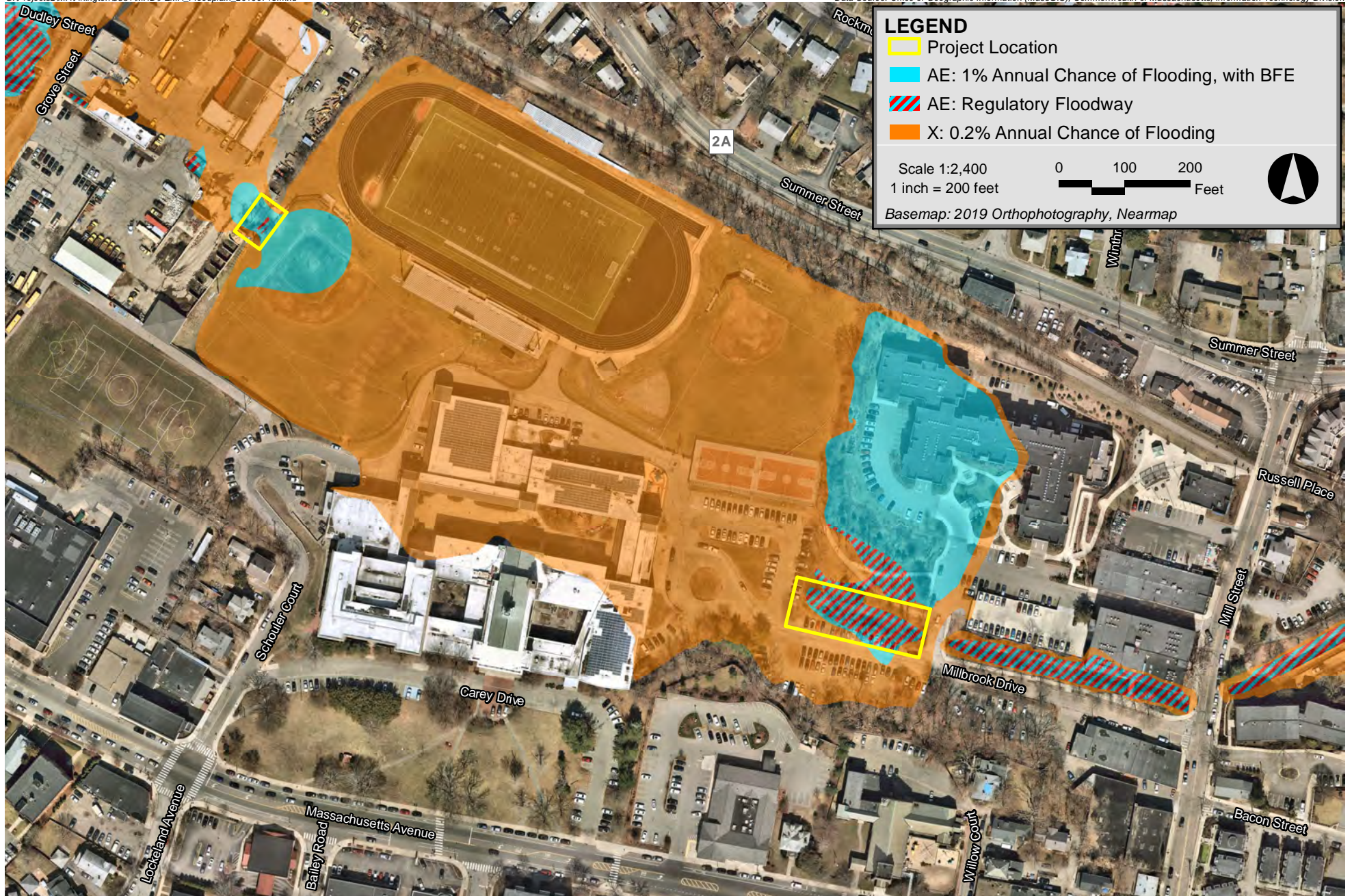
Figures



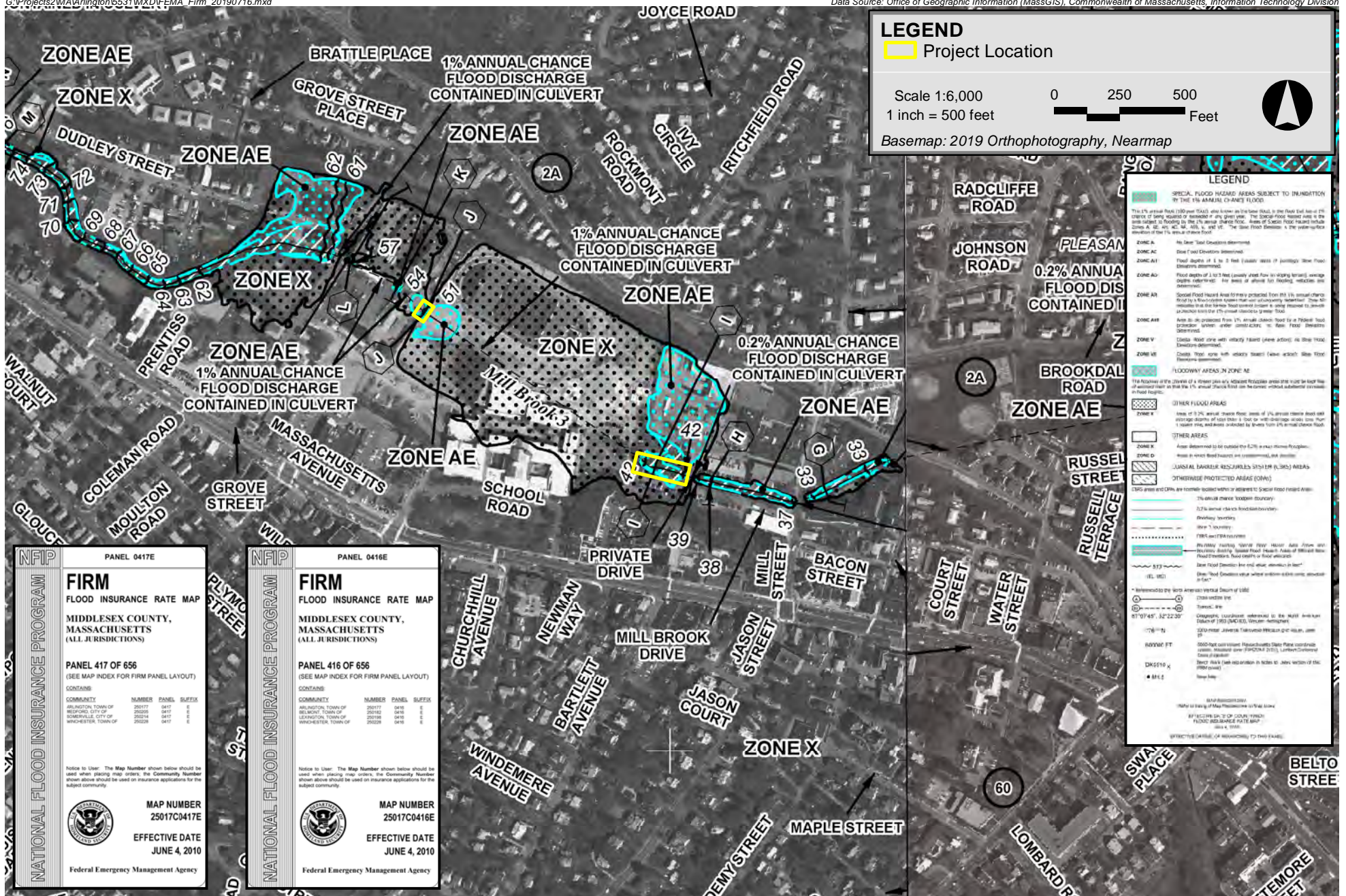
Figure 1



Arlington High School Wetland Delineation Arlington, Massachusetts



Arlington High School Wetland Delineation Arlington, Massachusetts



Arlington High School Wetland Delineation Arlington, Massachusetts



Arlington High School Wetland Delineation Arlington, Massachusetts

Attachment B

Site Photographs

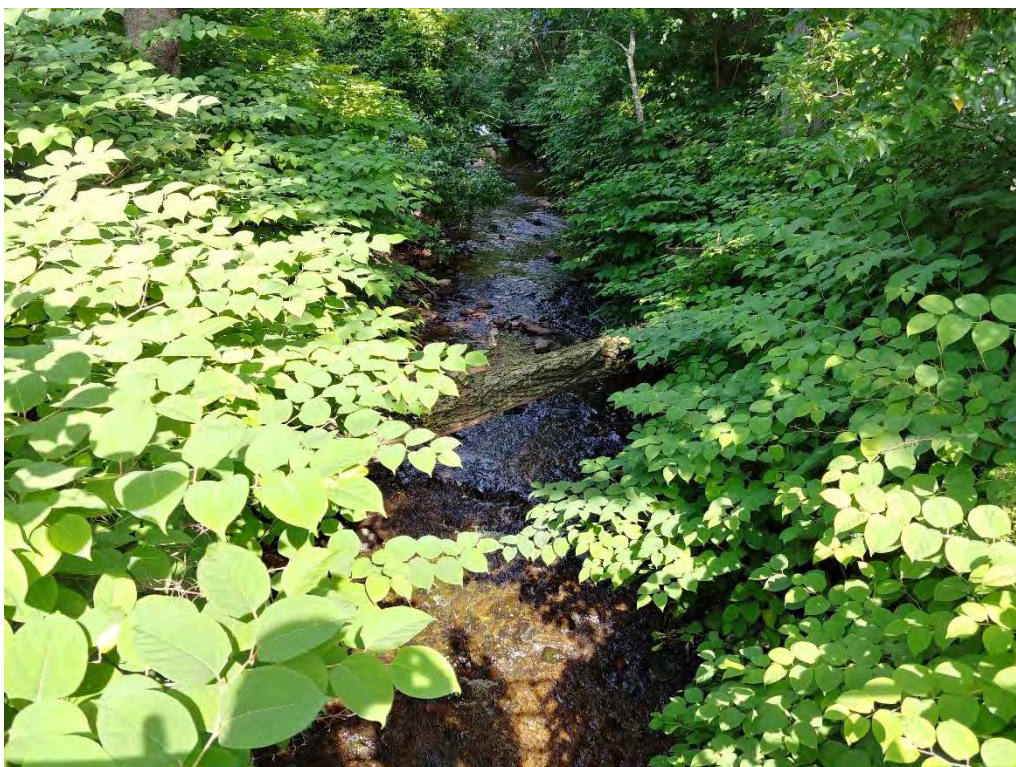


Photo 1. View of Bank Series AB from the concrete bridge between flags AB-1 and AB-101, looking west.



Photo 2. View of Bank Series AB between flags AB-3 and AB-103, looking east towards the concrete bridge connected to Mill Brook Drive.



Photo 3. View of stone wall bank, looking southeast near flag A-11 .



Photo 4. View of double culverts in Bank Series AB, looking east by bank flag AB-111.



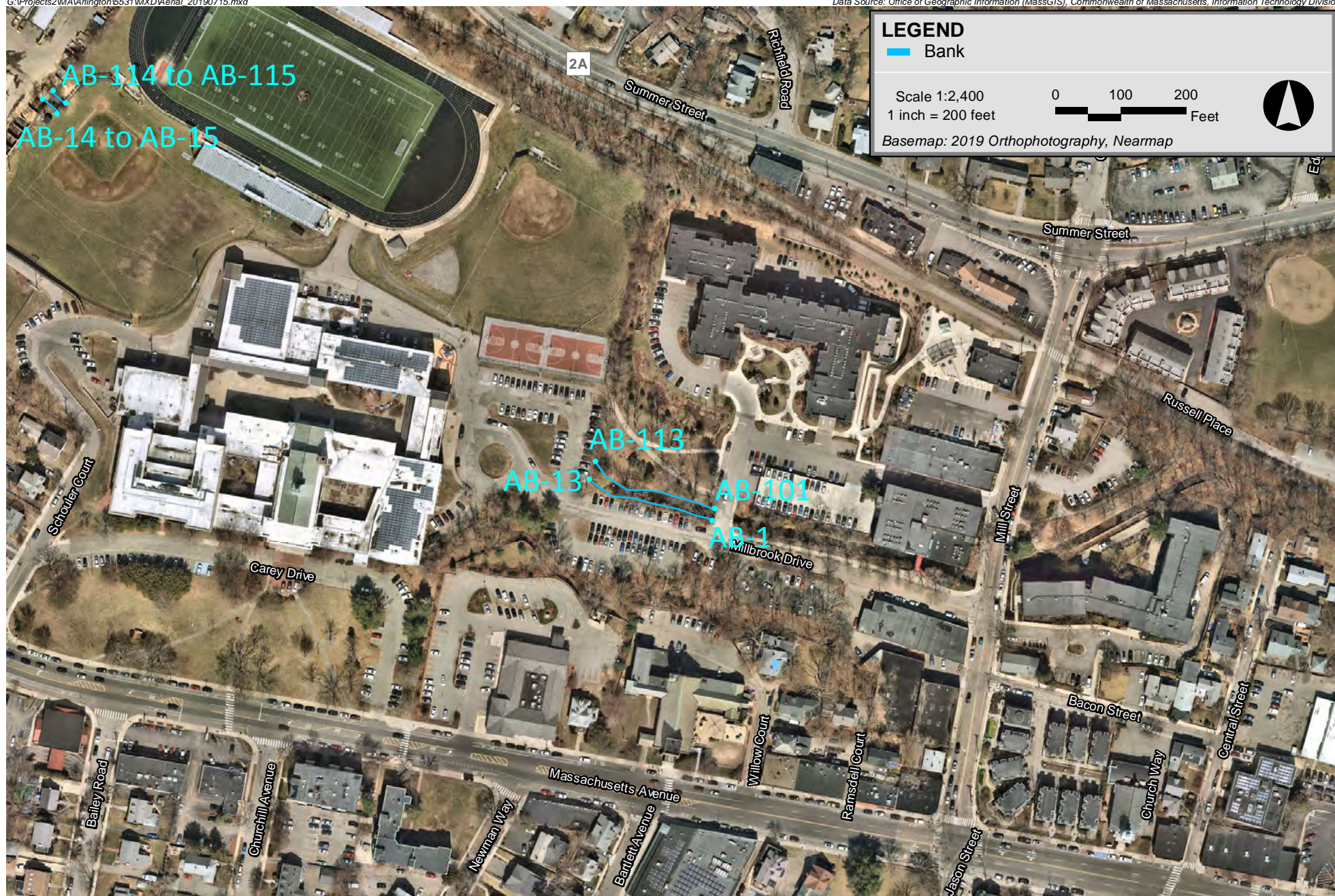
Photo 5. View of culverted portion of the Mill River looking north. These storm drains were located to the west of the basketball courts at the end of Mill Brook Drive.



Photo 6. View of Series AB on the western portion of the study area, looking east. Flag AB-115 pictured in the bottom left of the photo.

Attachment A

Wetland Sketch

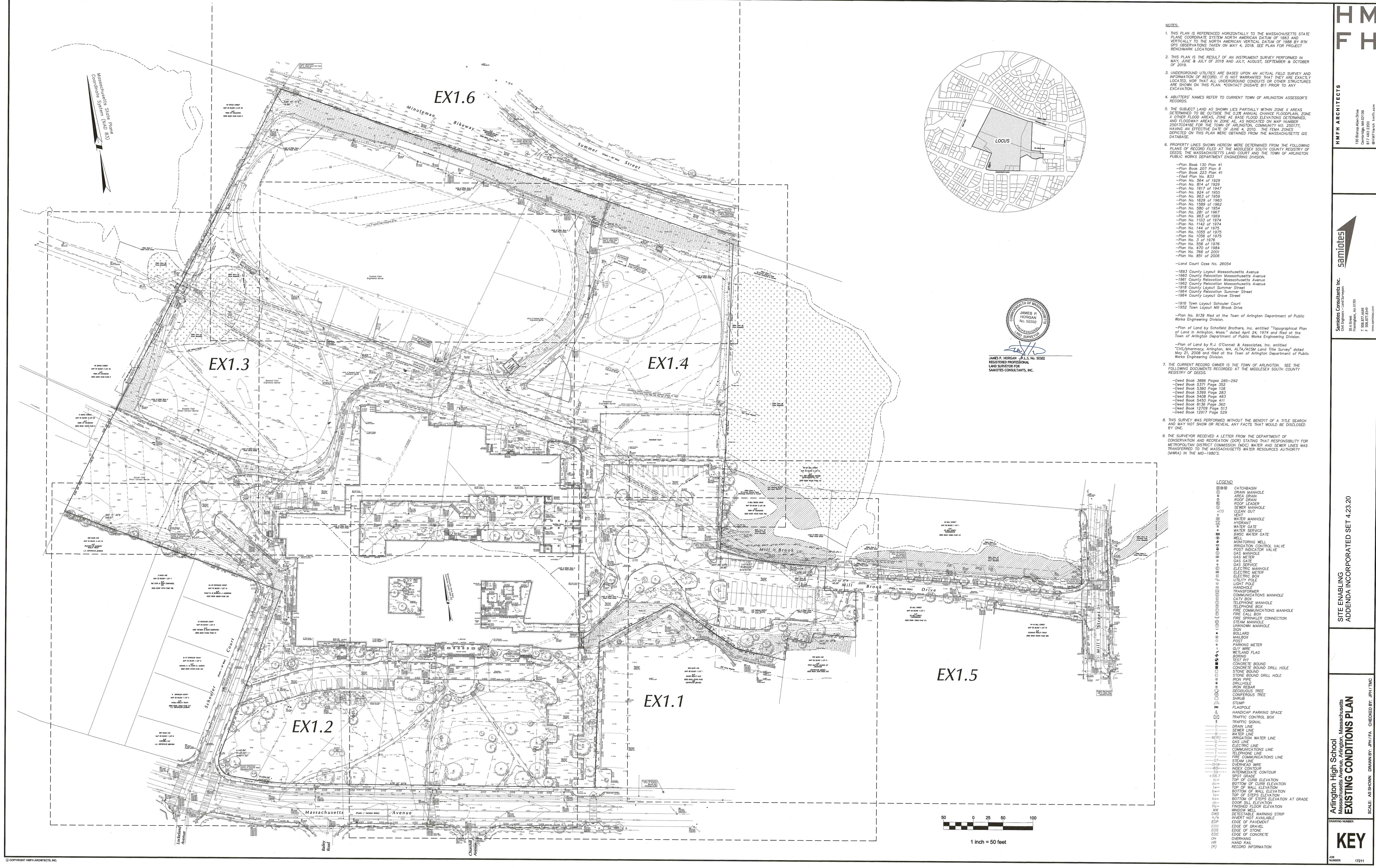


Arlington High School Wetland Delineation Arlington, Massachusetts

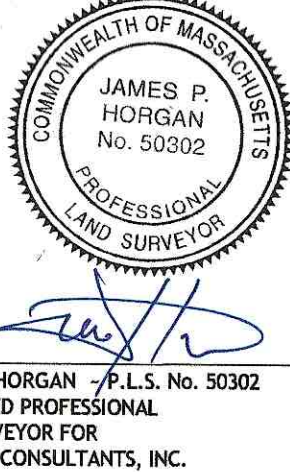
APPENDIX 4:
DRAWING LIST

DRAWING LIST

Drawing	Title	Date
KEY	Existing Conditions Plan	05-04-2020
EX1.1	Existing Conditions Plan	05-04-2020
EX1.2	Existing Conditions Plan	05-04-2020
EX1.3	Existing Conditions Plan	05-04-2020
EX1.4	Existing Conditions Plan	05-04-2020
EX1.5	Existing Conditions Plan	05-04-2020
EX1.6	Existing Conditions Plan	05-04-2020
C-0.0	Cover Sheet	05-07-2020
C-1.0	Site Preparation and Erosion Control Plan	05-07-2020
C-2.0	Vehicular and Signage Plan	05-07-2020
C-3.0	Grading Plan	05-07-2020
C-4.0	Overall Utility Plan	05-07-2020
C-4.1	Utility Plan A	05-07-2020
C-4.2	Utility Plan B	05-07-2020
C-4.3	Utility Plan C	05-07-2020
C-4.4	Utility Plan D	05-07-2020
C-5.0	Details Sheet	05-07-2020
C-5.1	Details Sheet	05-07-2020
C-5.2	Details Sheet	05-07-2020



- NOTES:
1. THIS PLAN IS REFERENCED HORIZONTALLY TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983 AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 BY RTK GPS OBSERVATIONS TAKEN ON MAY 4, 2016. SEE PLAN FOR PROJECT BENCHMARK LOCATIONS.
 2. THIS PLAN IS THE RESULT OF AN INSTRUMENT SURVEY PERFORMED IN MAY, JUNE & JULY OF 2016 AND AUGUST, SEPTEMBER & OCTOBER OF 2016.
 3. UNDERGROUND UTILITIES ARE BASED UPON AN ACTUAL FIELD SURVEY AND INFORMATION OF RECORD. IT IS NOT WARRANTED THAT THEY ARE EXACTLY LOCATED, NOR THAT ALL UNDERGROUND CONDUITS OR OTHER STRUCTURES ARE SHOWN ON THIS PLAN. "CONTACT DIGSAFE 811 PRIOR TO ANY EXCAVATION."
 4. ABUTTERS' NAMES REFER TO CURRENT TOWN OF ARLINGTON ASSESSOR'S RECORDS.
 5. THE SUBJECT LAND AS SHOWN LIES PARTIALLY WITHIN ZONE X AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, ZONE X OTHER FLOOD AREAS, ZONE AE BASE FLOOD ELEVATIONS DETERMINED, AND FLOODWAY AREAS IN ZONE AE, AS INDICATED ON MAP NUMBER 25070486 FOR THE TOWN OF ARLINGTON, COMMUNITY NO. 250777, HAVING AN EFFECTIVE DATE OF JUNE 4, 2010. THE FEMA ZONES DERIVED ON THIS PLAN WERE OBTAINED FROM THE MASSACHUSETTS GIS DATABASE.
 6. PROPERTY LINES SHOWN HEREON WERE DETERMINED FROM THE FOLLOWING PLANS OF RECORD FILED AT THE MIDDLESEX SOUTH COUNTY REGISTRY OF DEEDS, THE MASSACHUSETTS LAND COURT AND THE TOWN OF ARLINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION.
 - Plan Book 130 Plan 41
 - Plan Book 207 Plan 8
 - Plan Book 223 Plan 41
 - Filed Plan No. 433
 - Plan No. 564 of 1929
 - Plan No. 814 of 1929
 - Plan No. 1617 of 1947
 - Plan No. 924 of 1955
 - Plan No. 863 of 1959
 - Plan No. 1639 of 1960
 - Plan No. 1589 of 1962
 - Plan No. 980 of 1964
 - Plan No. 281 of 1967
 - Plan No. 963 of 1969
 - Plan No. 1103 of 1974
 - Plan No. 1142 of 1974
 - Plan No. 144 of 1979
 - Plan No. 1055 of 1975
 - Plan No. 1056 of 1975
 - Plan No. 3 of 1976
 - Plan No. 555 of 1976
 - Plan No. 470 of 1984
 - Plan No. 786 of 2001
 - Plan No. 851 of 2006
 - Land Court Case No. 26054
 - 1893 County Layout Massachusetts Avenue
 - 1860 County Relocation Massachusetts Avenue
 - 1861 County Relocation Massachusetts Avenue
 - 1892 County Relocation Massachusetts Avenue
 - 1918 County Layout Summer Street
 - 1864 County Relocation Summer Street
 - 1864 County Layout Grove Street
 - 1910 Town Layout Schuler Court
 - 1952 Town Layout Hill Brook Drive
 - Plan No. 9139 Filed at the Town of Arlington Department of Public Works Engineering Division.
 - Plan of Land by Schofield Brothers, Inc. entitled "Topographical Plan of Land in Arlington, Mass." dated April 24, 1974 and filed at the Town of Arlington Department of Public Works Engineering Division.
 - Plan of Land by R.J. O'Connell & Associates, Inc. entitled "CVS/pharmacy, Arlington, MA, ALTA/ACSM Land Title Survey" dated May 21, 2008 and filed at the Town of Arlington Department of Public Works Engineering Division.
 7. THE CURRENT RECORD OWNER IS THE TOWN OF ARLINGTON. SEE THE FOLLOWING DOCUMENTS RECORDED AT THE MIDDLESEX SOUTH COUNTY REGISTRY OF DEEDS:
 - Deed Book 3886 Pages 285-292
 - Deed Book 5371 Page 352
 - Deed Book 5380 Page 108
 - Deed Book 5399 Page 283
 - Deed Book 5408 Page 453
 - Deed Book 5450 Page 411
 - Deed Book 6136 Page 360
 - Deed Book 12709 Page 513
 - Deed Book 12917 Page 509
 8. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE SEARCH AND MAY NOT SHOW OR REVEAL ANY FACTS THAT WOULD BE DISCLOSED BY ONE.
 9. THE SURVEYOR RECEIVED A LETTER FROM THE DEPARTMENT OF CONSERVATION AND RECREATION (DCR) STATING THAT RESPONSIBILITY FOR METROPOLITAN DISTRICT COMMISSION (MDC) WATER AND SEWER LINES WAS TRANSFERRED TO THE MASSACHUSETTS WATER RESOURCES AUTHORITY (MWR) IN THE MID-1980'S.

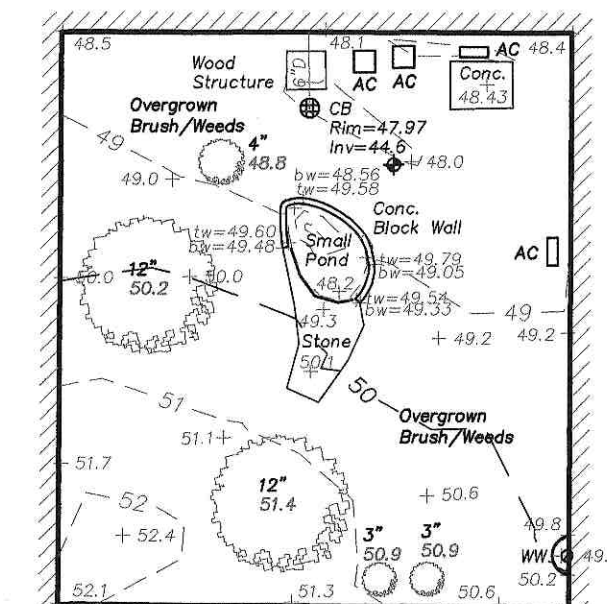
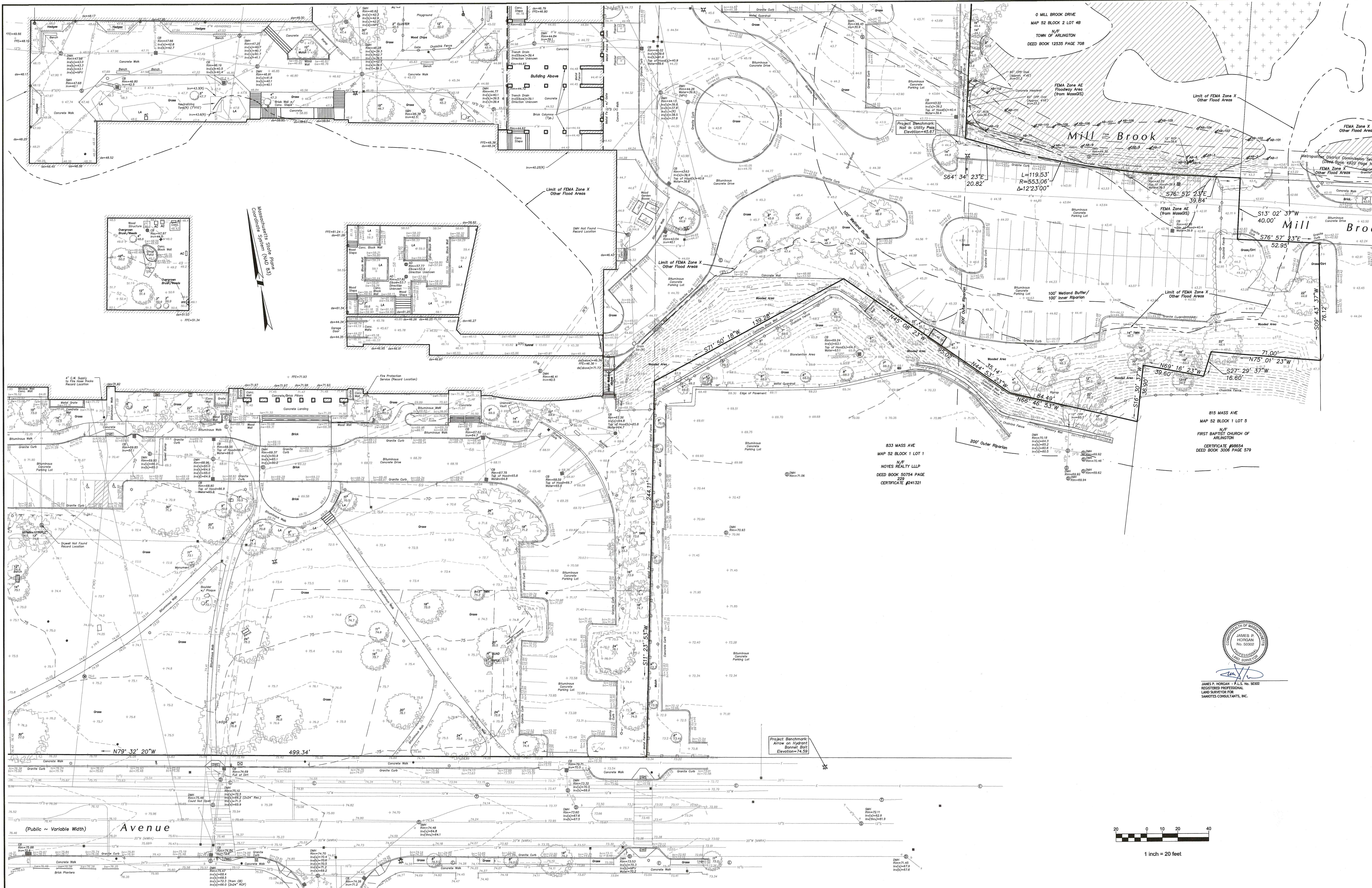


- LEGEND
- CATCHBASIN
 - DRAIN MANHOLE
 - AREA DRAIN
 - ROOF DRAIN
 - ROOF LEADER
 - SEWER MANHOLE
 - CLEAN OUT
 - VENT
 - WATER MANHOLE
 - HYDRAULIC
 - WATER GATE
 - BRICK WATER GATE
 - WELL
 - MONITORING WELL
 - IRRIGATION CONTROL VALVE
 - POST INDICATOR VALVE
 - GAS MANHOLE
 - GAS METER
 - GAS GATE
 - GAS SERVICE
 - ELECTRIC MANHOLE
 - ELECTRIC METER
 - ELECTRIC BOX
 - UTILITY POLE
 - LIGHT POLE
 - HANDHOLE
 - TRANSFORMER
 - COMMUNICATIONS MANHOLE
 - CATV BOX
 - TELEPHONE MANHOLE
 - TELEPHONE BOX
 - FIRE COMMUNICATIONS MANHOLE
 - FIRE CALL BOX
 - FIRE SPRINKLER CONNECTION
 - STEAM MANHOLE
 - UNKNOWN MANHOLE
 - SIGN
 - BOLLARD
 - MAILBOX
 - POST
 - PARKING METER
 - GUY WIRE
 - WETLAND FLAG
 - BORING
 - TEST PIT
 - CONCRETE BOUND
 - CONCRETE BOUND DRILL HOLE
 - STONE BOUND
 - STONE BOUND DRILL HOLE
 - IRON PIPE
 - DRILLHOLE
 - IRON REBAR
 - DECIDUOUS TREE
 - CONIFEROUS TREE
 - SHRUB
 - STUMP
 - FLAGPOLE
 - HANDICAP PARKING SPACE
 - TRAFFIC CONTROL BOX
 - TRAFFIC SIGNAL
 - DRAIN LINE
 - SEWER LINE
 - WATER LINE
 - IRRIGATION WATER LINE
 - GAS LINE
 - ELECTRIC LINE
 - COMMUNICATIONS LINE
 - TELEPHONE LINE
 - FIRE COMMUNICATIONS LINE
 - STEAM LINE
 - OVERHEAD WIRE
 - INDEX CONTOUR
 - INTERMEDIATE CONTOUR
 - SPOT GRADE
 - TOP OF CURB ELEVATION
 - BOTTOM OF CURB ELEVATION
 - TOP OF WALL ELEVATION
 - BOTTOM OF WALL ELEVATION
 - TOP OF STEPS ELEVATION
 - BOTTOM OF STEPS ELEVATION
 - FINISHED FLOOR ELEVATION AT GRADE
 - DOOR SILL ELEVATION
 - WINDOW WELL
 - DETECTABLE WARNING STRIP
 - INVERT NOT AVAILABLE
 - EDGE OF PAVEMENT
 - EDGE OF GRAVEL
 - EDGE OF STONE
 - EDGE OF CONCRETE
 - OVERHANG
 - HAND RAIL
 - RECORD INFORMATION

SITE ENABLING
ADDENDA INCORPORATED SET 4.23.20

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
EXISTING CONDITIONS PLAN

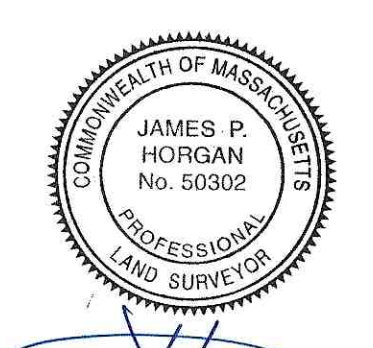
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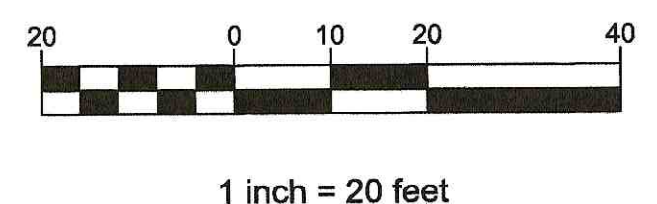
Massachusetts State Plane
Coordinate System (NAD 83)

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MAP 52 BLOCK 1 LOT 1
N/T
NOYES REALTY LLLP
DEED BOOK 50754 PAGE 229
CERTIFICATE #241321

815 MASS AVE
MAP 52 BLOCK 1 LOT 5
N/T
FIRST BAPTIST CHURCH OF
ARLINGTON
CERTIFICATE #8854
DEED BOOK 3006 PAGE 579



JAMES P. HORGAN - P.L.S. No. 50302
REGISTERED PROFESSIONAL
LAND SURVEYOR FOR
MASSACHUSETTS



1 inch = 20 feet

HM
FH
ARCHITECTS

139 Elmwood Avenue
Cambridge, MA 02139
617.482.2300
info@hmfh.com hmfh.com

samnotes

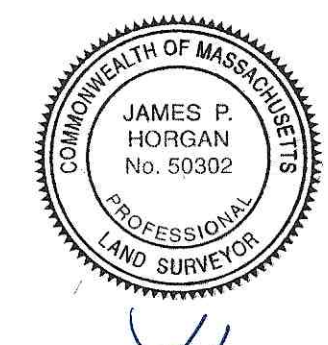
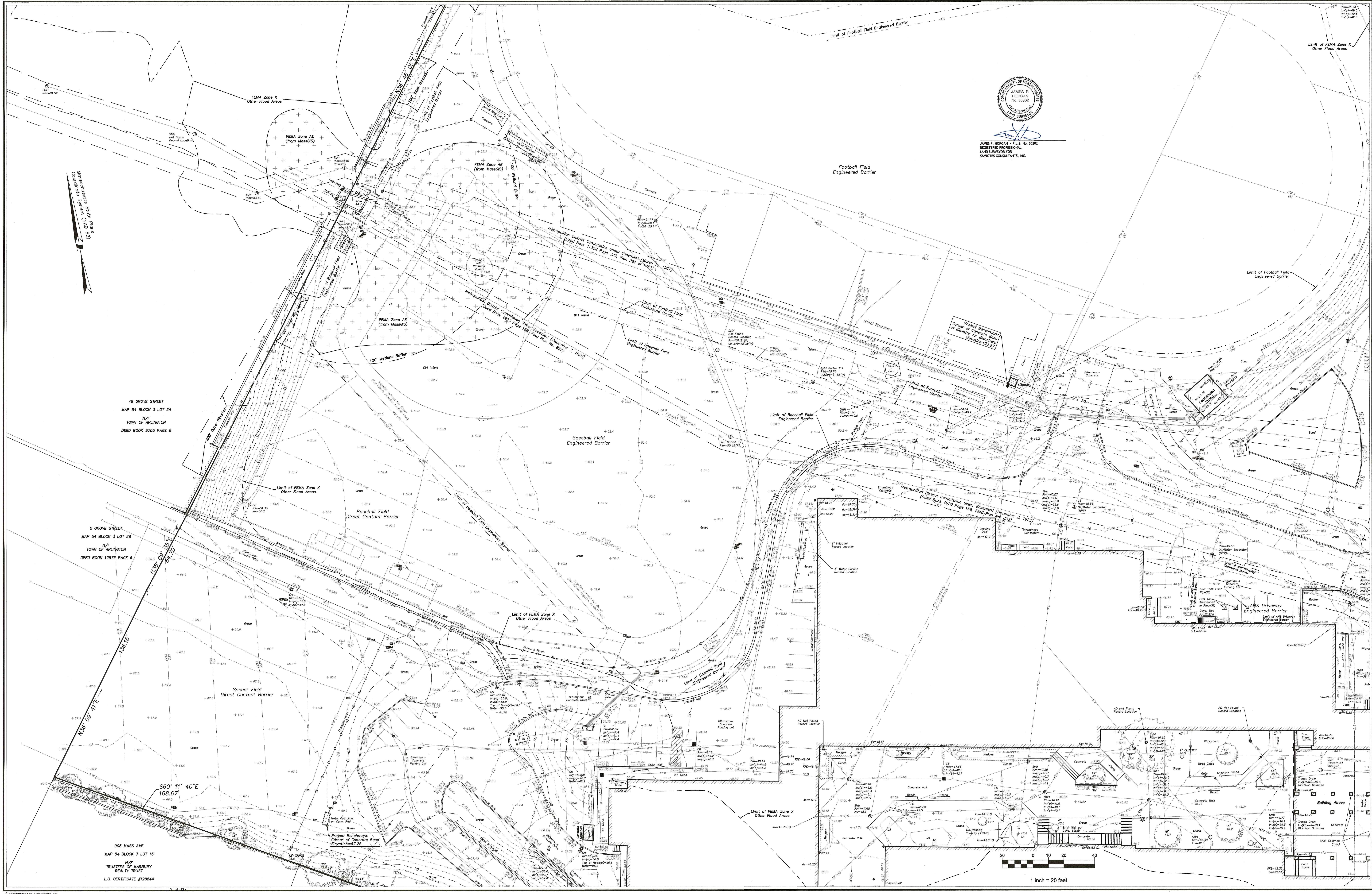
Samnotes Consultants, Inc.
Civil Engineers & Land Surveyors
20 A Street, North Andover, MA 01861
Tel: 978.877.4400
Fax: 978.877.8399
www.samnotes.com

**SITE ENABLING
ADDENDA INCORPORATED SET 4.23.20**

EXISTING CONDITIONS PLAN

EX1.1

17211



JAMES P. HORGAN - F.L.S. No. 50302
REGISTERED PROFESSIONAL
LAND SURVEYOR FOR
SAMOTES CONSULTANTS, INC.

HM
FH

HMFH ARCHITECTS

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F: 508.877.8689
www.hmfh.com

Samotes Consultants Inc.

Civil Engineers • Land Surveyors

20 A Street
Framingham, MA 01701
P: 508.877.8688
F: 508.877.8689
www.samotes.com

SITE ENABLING
ADDENDA INCORPORATED SET 4.23.20

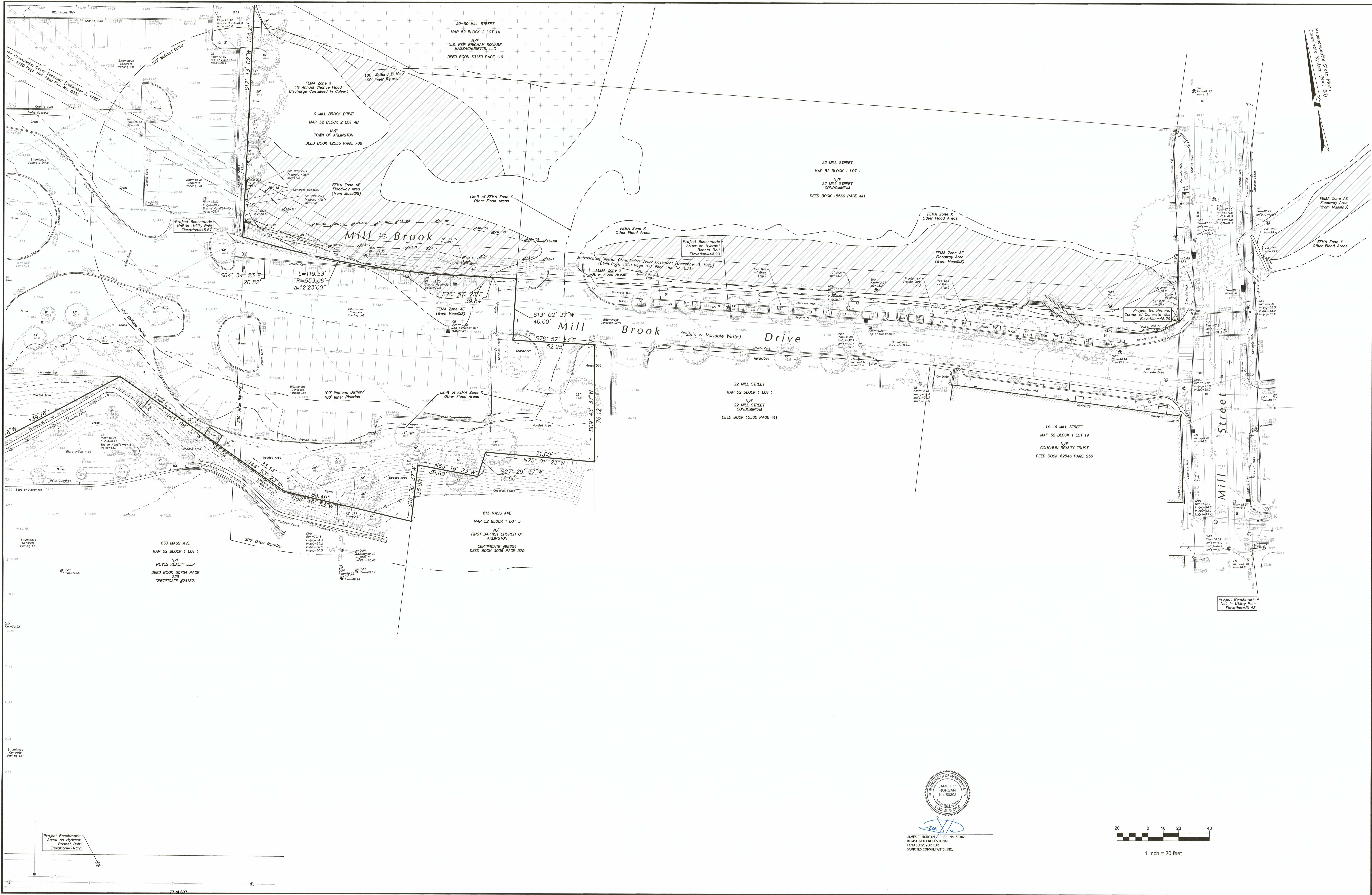
Arlington High School
Massachusetts Avenue, Arlington, Massachusetts

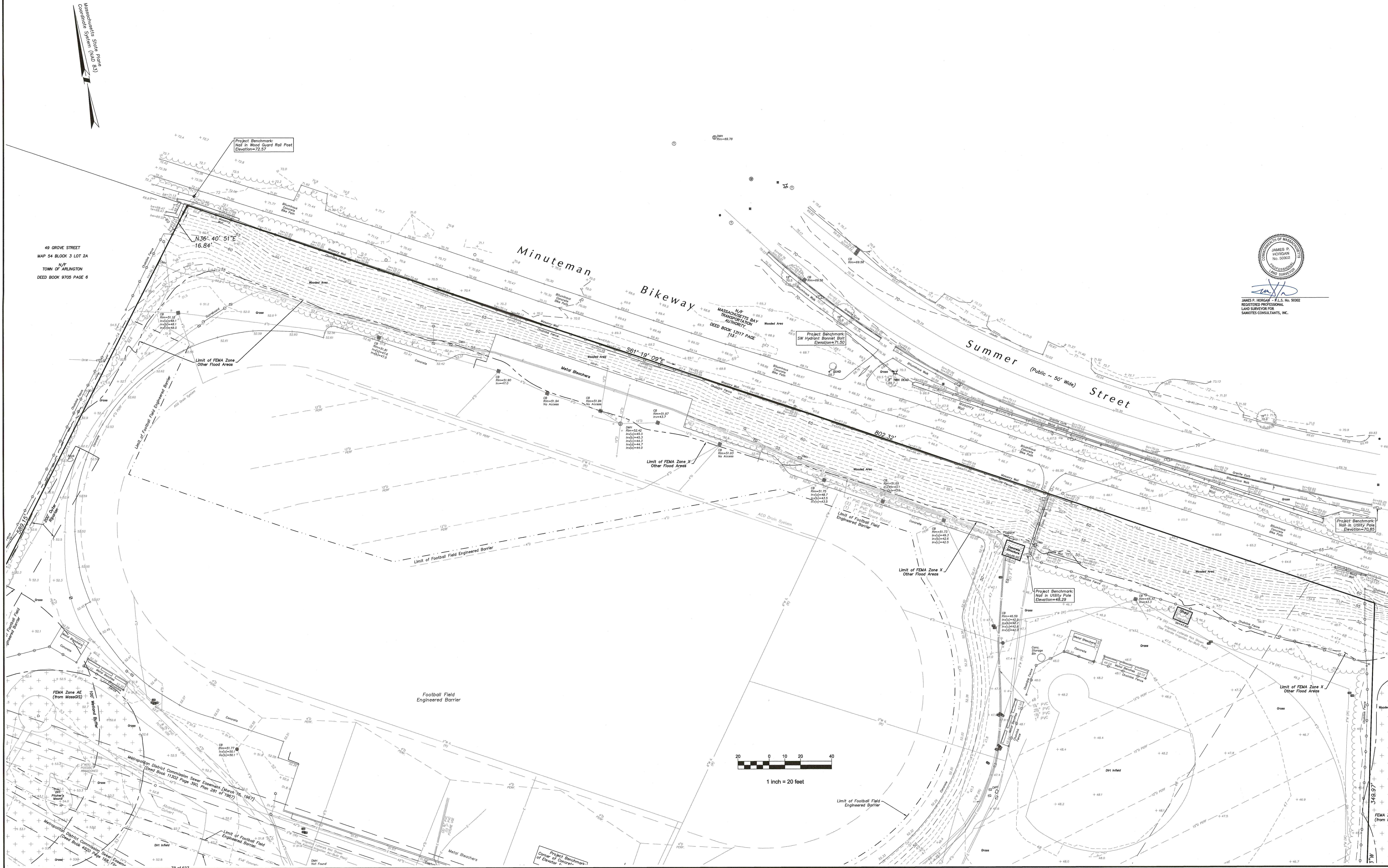
EXISTING CONDITIONS PLAN

DRAWING NUMBER

EX1.3

17211





ARLINGTON HIGH SCHOOL PROJECT
NOTICE OF INTENT FILING
ARLINGTON CONSERVATION COMMISION



SHEET INDEX	
C-0.0	COVER SHEET
C-1.0	SITE PREPARATION & EROSION CONTROL PLAN
C-2.0	VEHICLE & SIGNAGE PLAN
C-3.0	GRADING PLAN
C-4.0	OVERALL UTILITY PLAN
C-4.1	UTILITY PLAN A
C-4.2	UTILITY PLAN B
C-4.3	UTILITY PLAN C
C-4.4	UTILITY PLAN D
C-5.0	DETAILS SHEET
C-5.1	DETAILS SHEET
C-5.2	DETAILS SHEET



KEYPLAN

REVISIONS NO. DATE REMARKS BY

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts

COVER SHEET

SCALE: 1"=40'

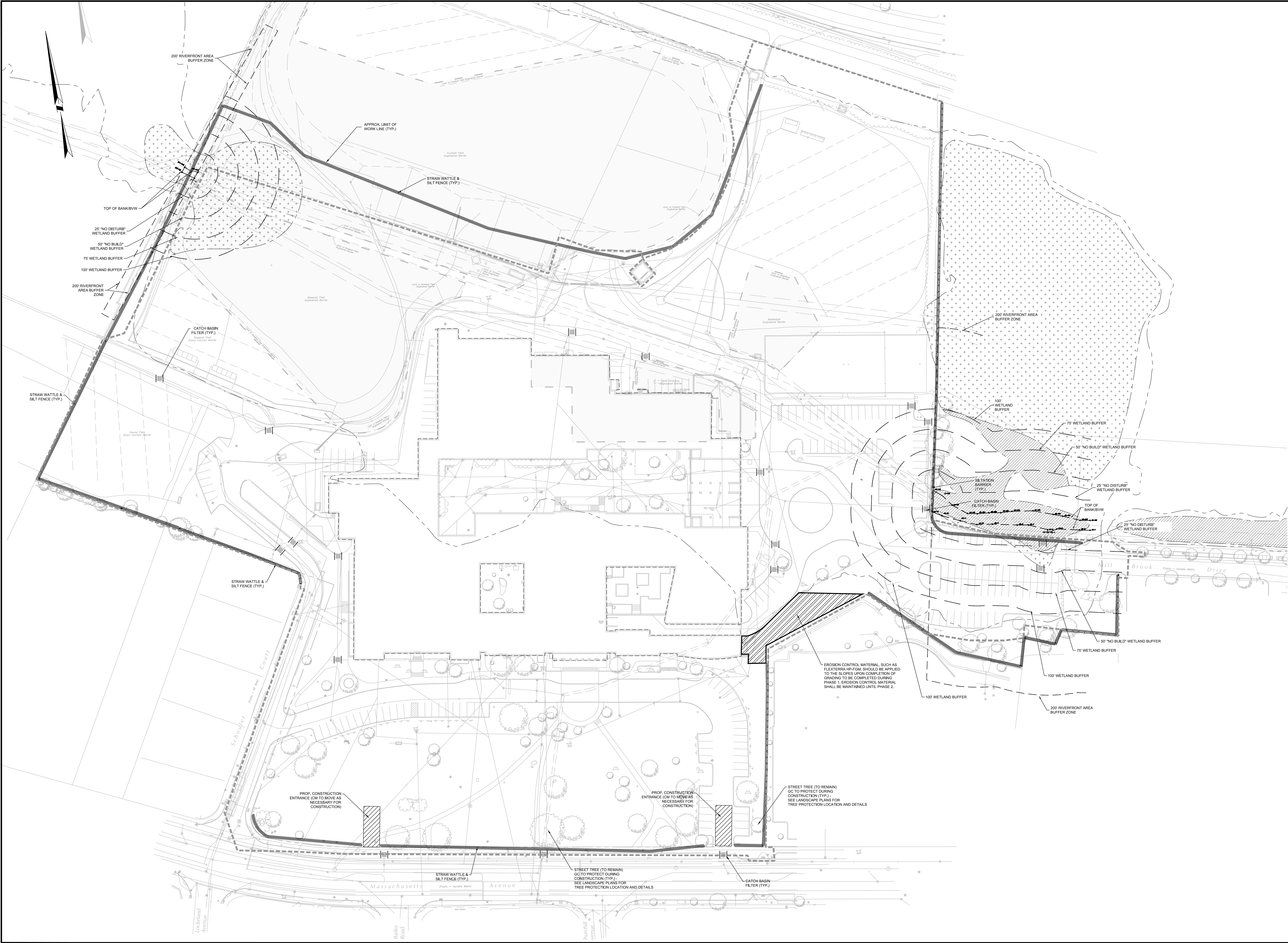
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BY

DRAWING NUMBER

C-0.0

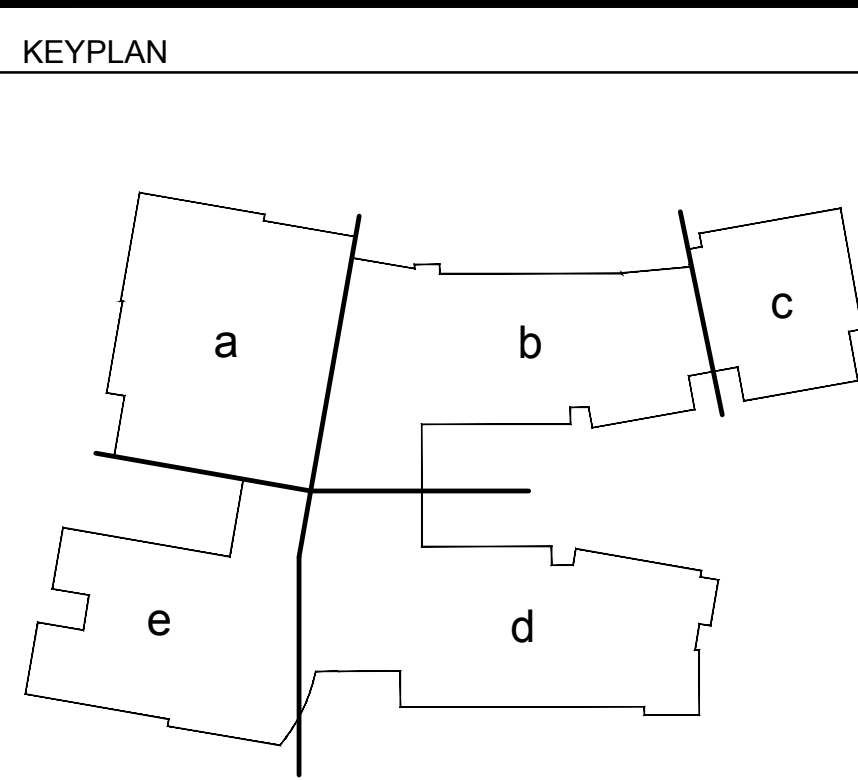
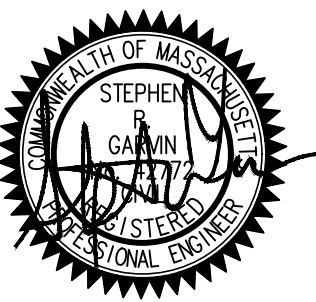
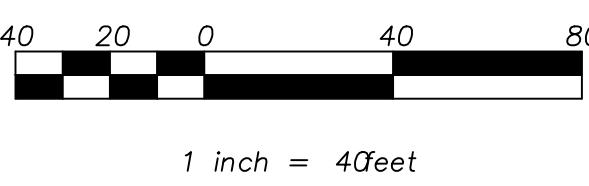
JOB NUMBER: 17211



NOTE:
THE CONTRACTOR SHALL PHASE ALL
DEMOLITION AND REMOVAL WORK
TO ALLOW FOR THE CONTINUING
OPERATION OF ALL STRUCTURES
OUTSIDE OF LIMIT OF WORK.

NOTE:
DRAWING DOES NOT SHOW ENTIRE
SCOPE OF DEMO. IT IS INTENDED TO
AID CONTRACTOR WITH IDENTIFYING
WORK AND IS NOT ALL INCLUSIVE.

- LEGEND:
- TREE PROTECTION
 - BUILDING TO BE REMOVED
 - LIMIT OF WORK
 - EROSION CONTROL
 - PROPOSED CATCHBASIN FILTER



REVISIONS NO.	DATE	REMARKS	BY

HM FH

HM FH ARCHITECTS

Samioles Consultants Inc.
Civil Engineers - Land Surveyors
20 A Street, Woburn, MA 01801
Tel: 781.938.7739
Fax: 781.938.7739
www.samioles.com

CONSERVATION COMMISSION FILING SET

05-07-2020

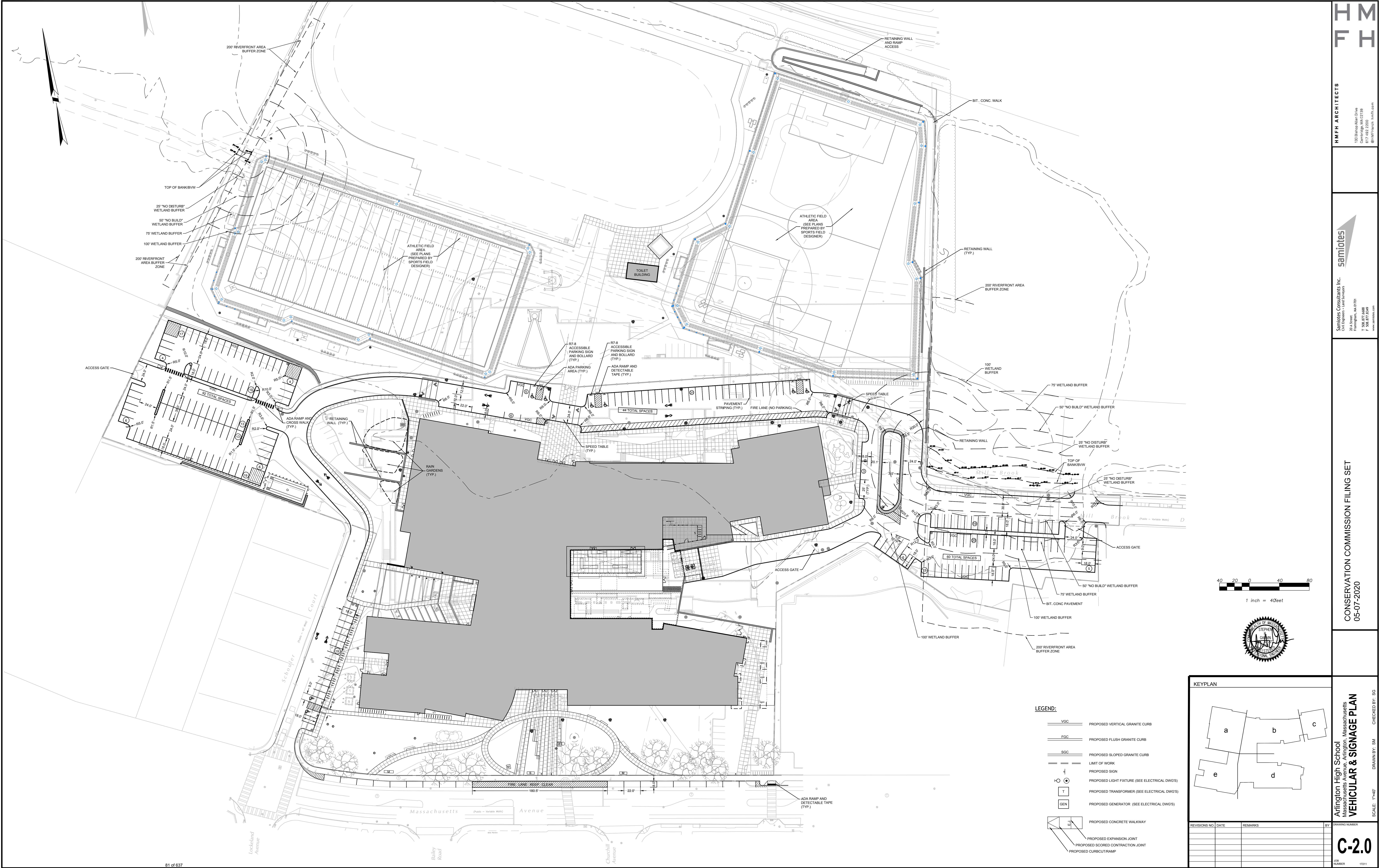
Arlington High School
Massachusetts Avenue, Arlington, Massachusetts

**SITE PREPARATION & EROSION
CONTROL PLAN**

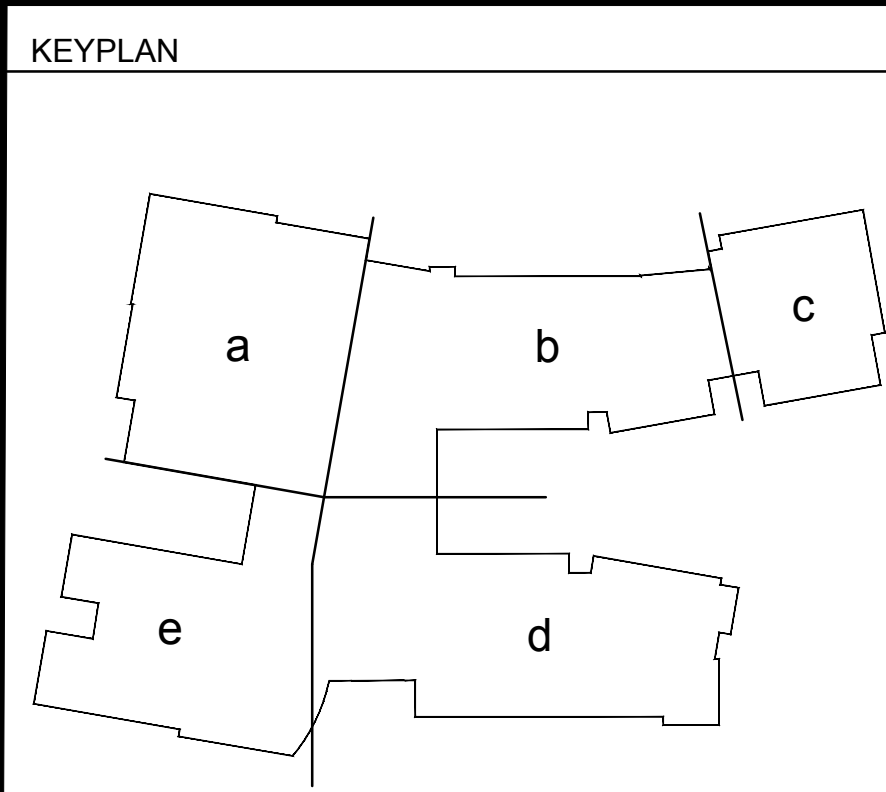
SCALE: 1"=40'
DRAWN BY: SM
CHECKED BY: SG

17211

C-1.0



- LEGEND:**
- VSG PROPOSED VERTICAL GRANITE CURB
 - FGC PROPOSED FLUSH GRANITE CURB
 - SGC PROPOSED SLOPED GRANITE CURB
 - LIMIT OF WORK
 - PROPOSED SIGN
 - PROPOSED LIGHT FIXTURE (SEE ELECTRICAL DWG'S)
 - T PROPOSED TRANSFORMER (SEE ELECTRICAL DWG'S)
 - GEN PROPOSED GENERATOR (SEE ELECTRICAL DWG'S)
 - PROPOSED CONCRETE WALKWAY
 - PROPOSED EXPANSION JOINT
 - PROPOSED SCORED CONTRACTION JOINT
 - PROPOSED CURB/CUT/RAMP



REVISIONS NO.	DATE	REMARKS

BY: _____
DRAWING NUMBER: **C-2.0**
JOB NUMBER: 17211

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
VEHICULAR & SIGNAGE PLAN
SCALE: 1"=40'
DRAWN BY: SM
CHECKED BY: SG

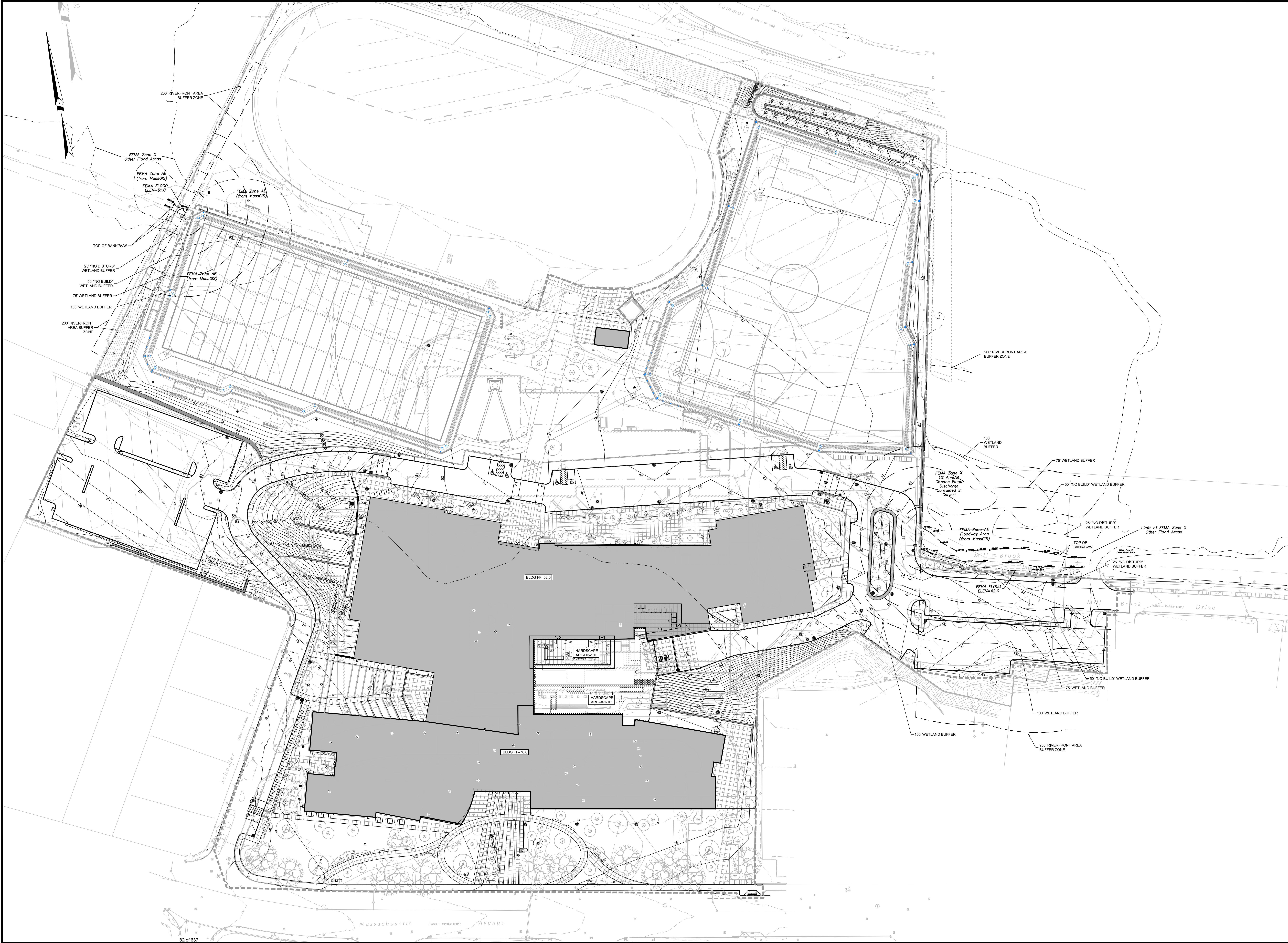
CONSERVATION COMMISSION FILING SET
05-07-2020

Samtotes Consultants Inc.
1000 Main Street
Framingham, MA 01701
T 508.877.6688
F 508.877.8849
www.samtotes.com

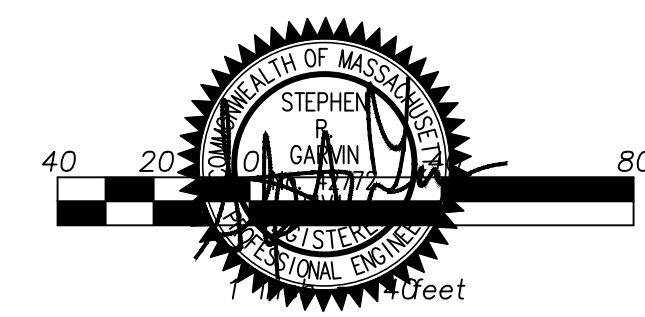
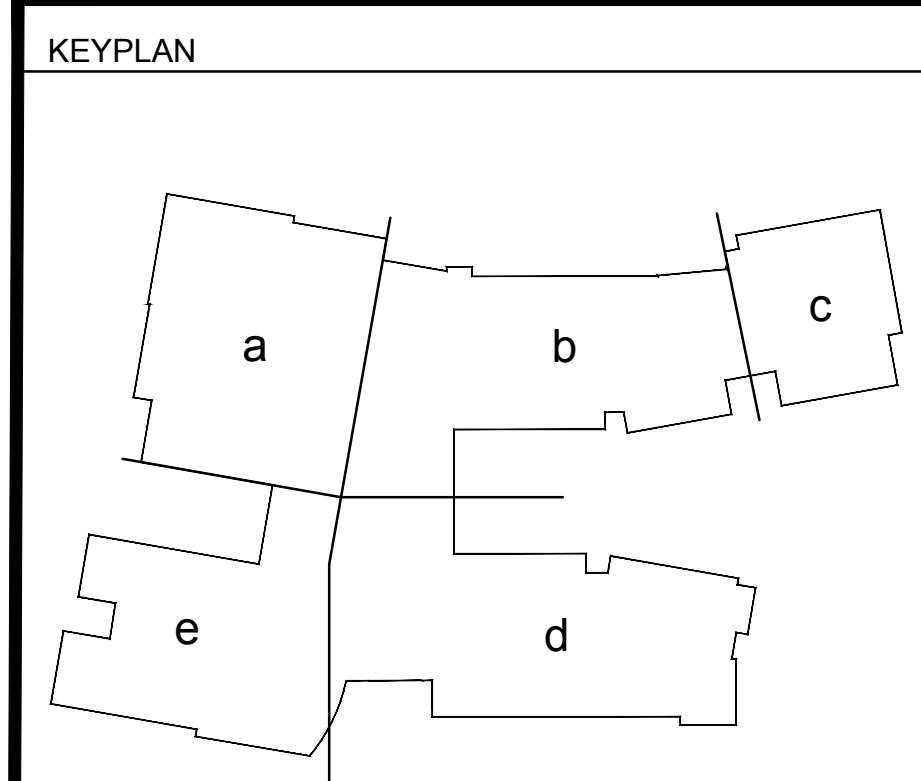
samtotes

HMFH ARCHITECTS
130 Bishop Allen Drive
Cambridge, MA 02138
877.482.2200
www.hmfh.com

HMFH



REVISIONS NO.	DATE	REMARKS



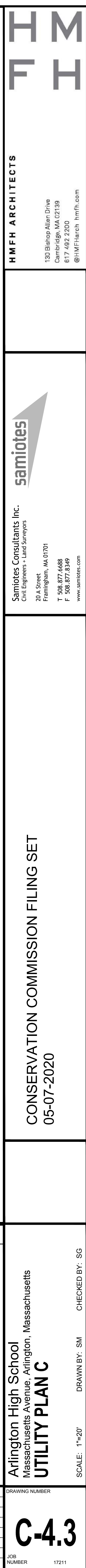
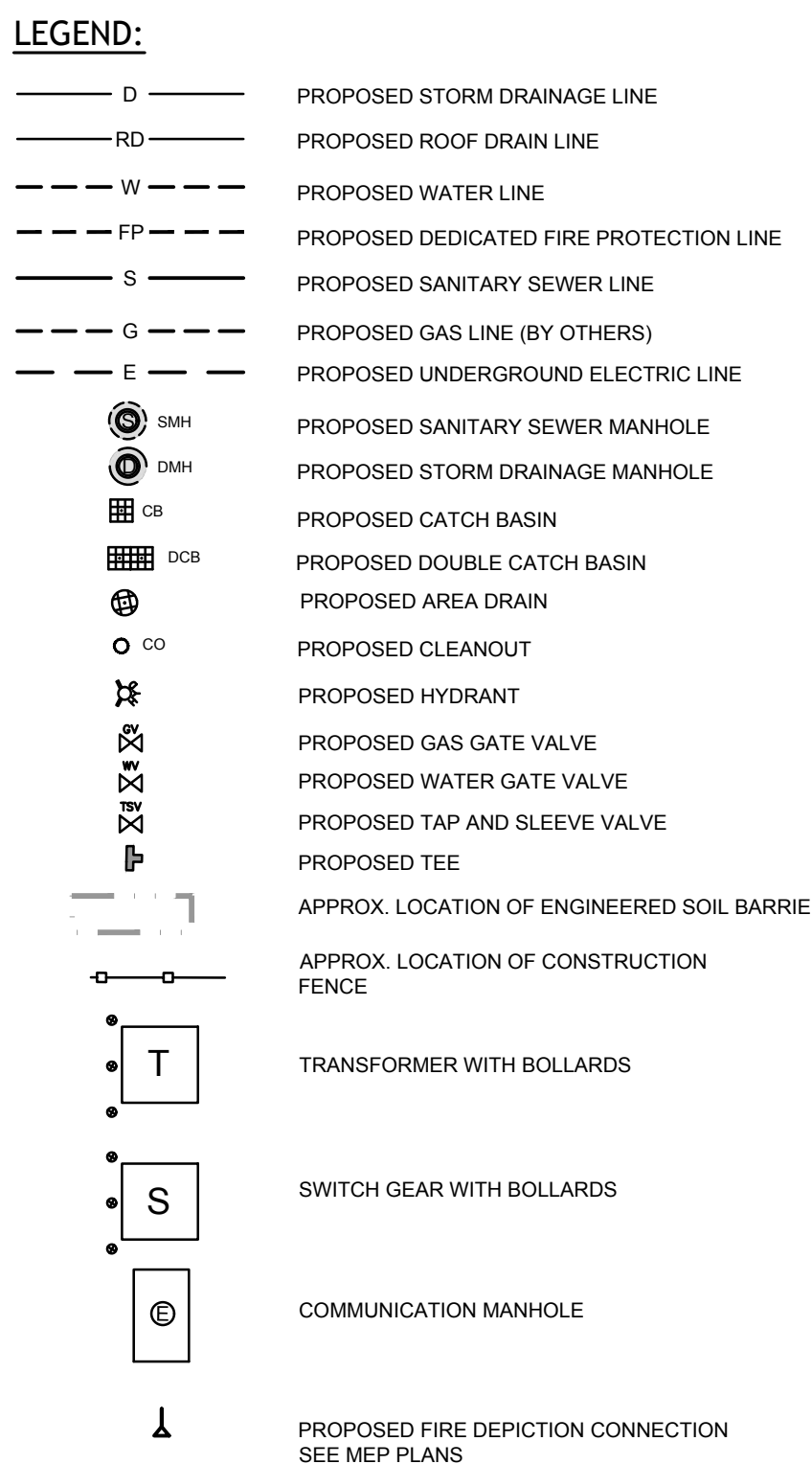
Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
GRADING PLAN
SCALE: 1"=40'
DRAWN BY: SM
CHECKED BY: SG

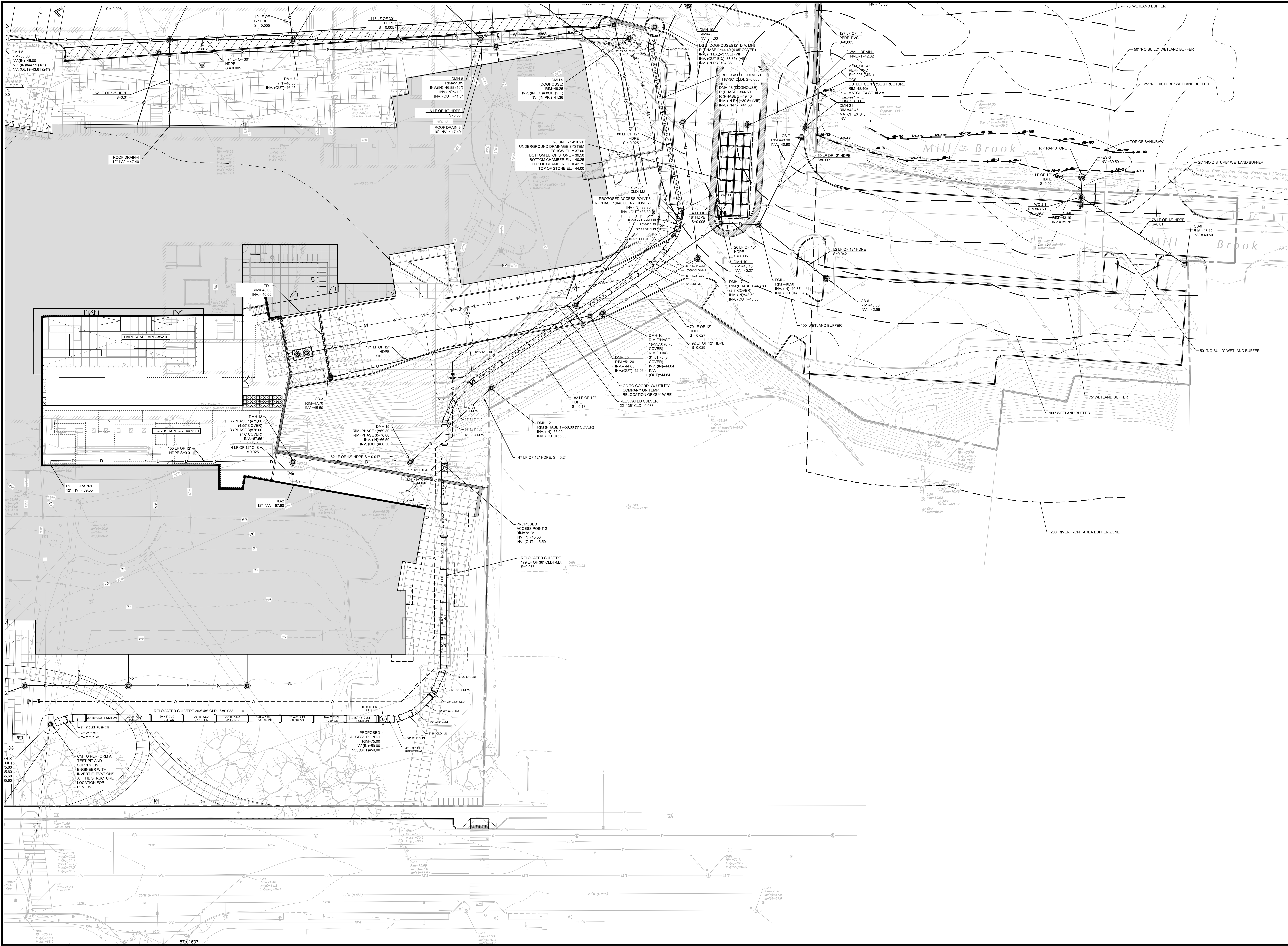
C-3.0
JOB NUMBER 17211

CONSERVATION COMMISSION FILING SET
05-07-2020

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www.samtotes.com

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FH
HM FH ARCHITECTS
130 Bishop Allen Drive
Cambridge, MA 02138
877.482.2200
info@hmfh.com





LEGEND:

- D — PROPOSED STORM DRAINAGE LINE
- RD — PROPOSED ROOF DRAIN LINE
- W — PROPOSED WATER LINE
- FP — PROPOSED DEDICATED FIRE PROTECTION LINE
- S — PROPOSED SANITARY SEWER LINE
- G — PROPOSED GAS LINE (BY OTHERS)
- E — PROPOSED UNDERGROUND ELECTRIC LINE
- BMH — PROPOSED SANITARY SEWER MANHOLE
- CB — PROPOSED STORM DRAINAGE MANHOLE
- CO — PROPOSED CATCH BASIN
- CD — PROPOSED DOUBLE CATCH BASIN
- CO — PROPOSED CLEANOUT
- HY — PROPOSED HYDRANT
- GV — PROPOSED GAS GATE VALVE
- WGV — PROPOSED WATER GATE VALVE
- TSV — PROPOSED TAP AND SLEEVE VALVE
- TEE — PROPOSED TEE
- ESB — APPROX. LOCATION OF ENGINEERED SOIL BARRIER
- FC — APPROX. LOCATION OF CONSTRUCTION FENCE
- T — TRANSFORMER WITH BOLLARDS
- S — SWITCH GEAR WITH BOLLARDS
- CM — COMMUNICATION MANHOLE
- FC — PROPOSED FIRE DEPICTION CONNECTION SEE MEP PLANS

KEYPLAN

Scale: 1"=20'

North Arrow

Scale Bar: 0 10 20 30 40 Feet

REVISIONS NO.	DATE	REMARKS

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130 Bishop Allen Drive
Cambridge, MA 02138
877.682.2200
877.682.2200
www.samotes.com

Conservation Commission Filing Set

05-07-2020

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts

UTILITY PLAN D

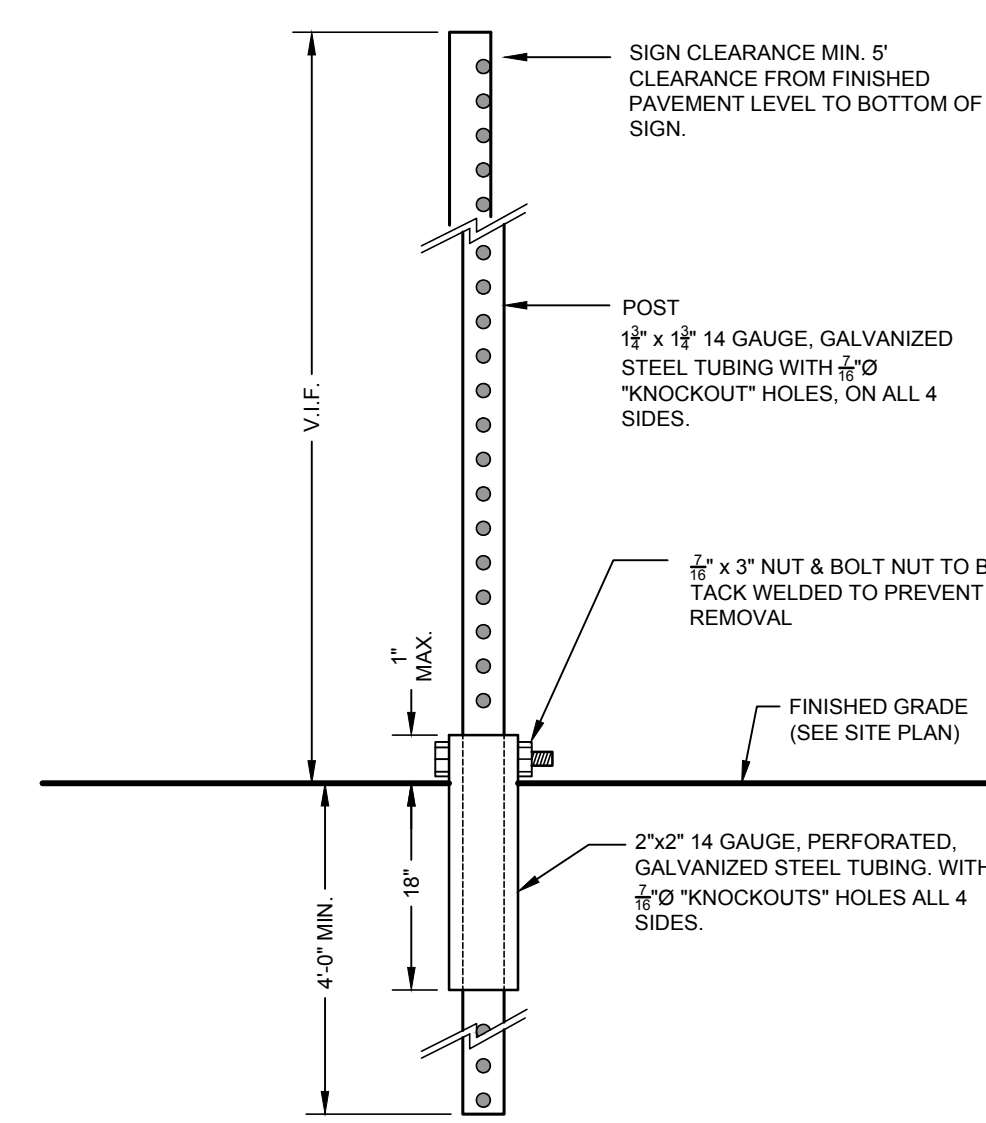
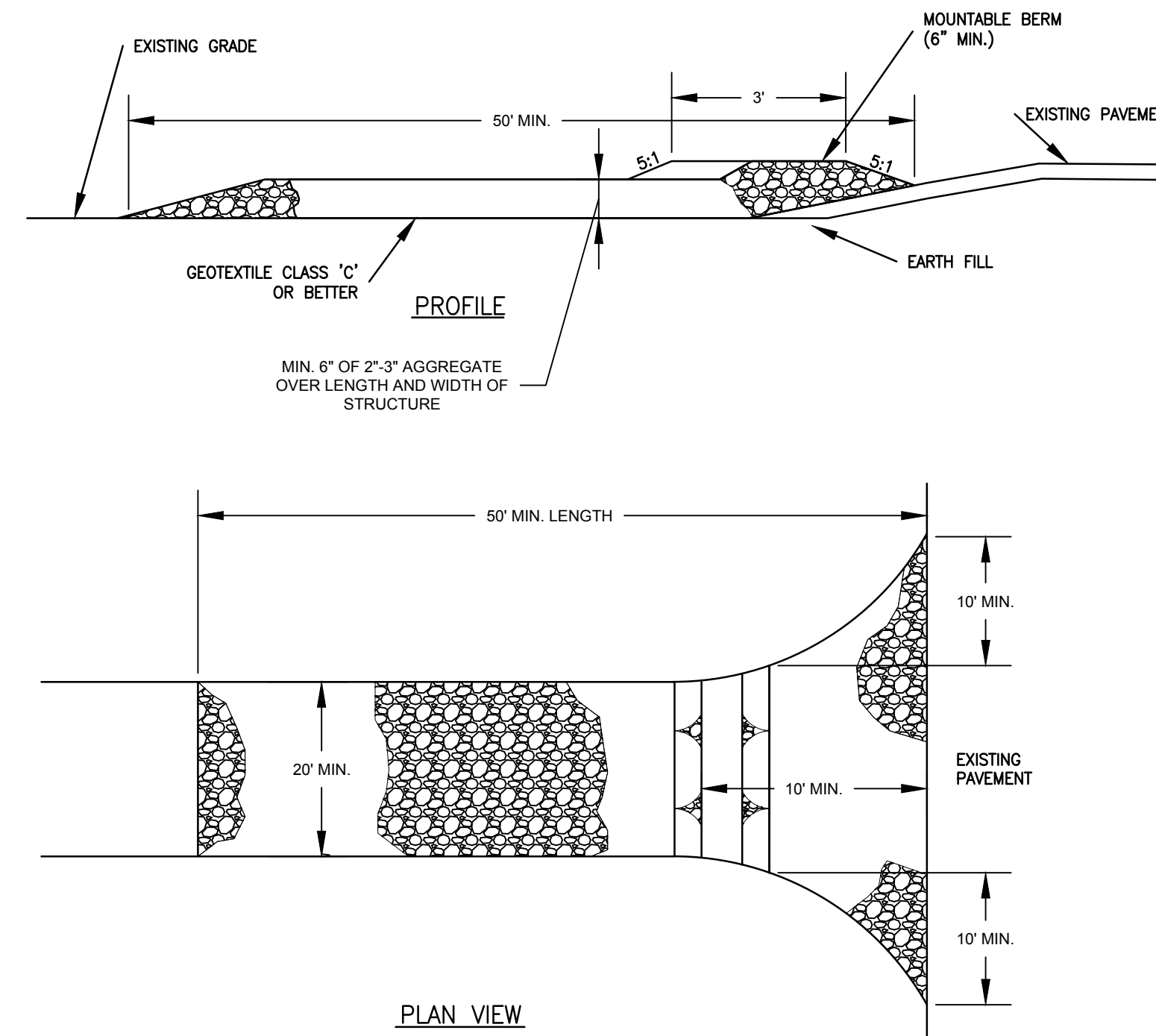
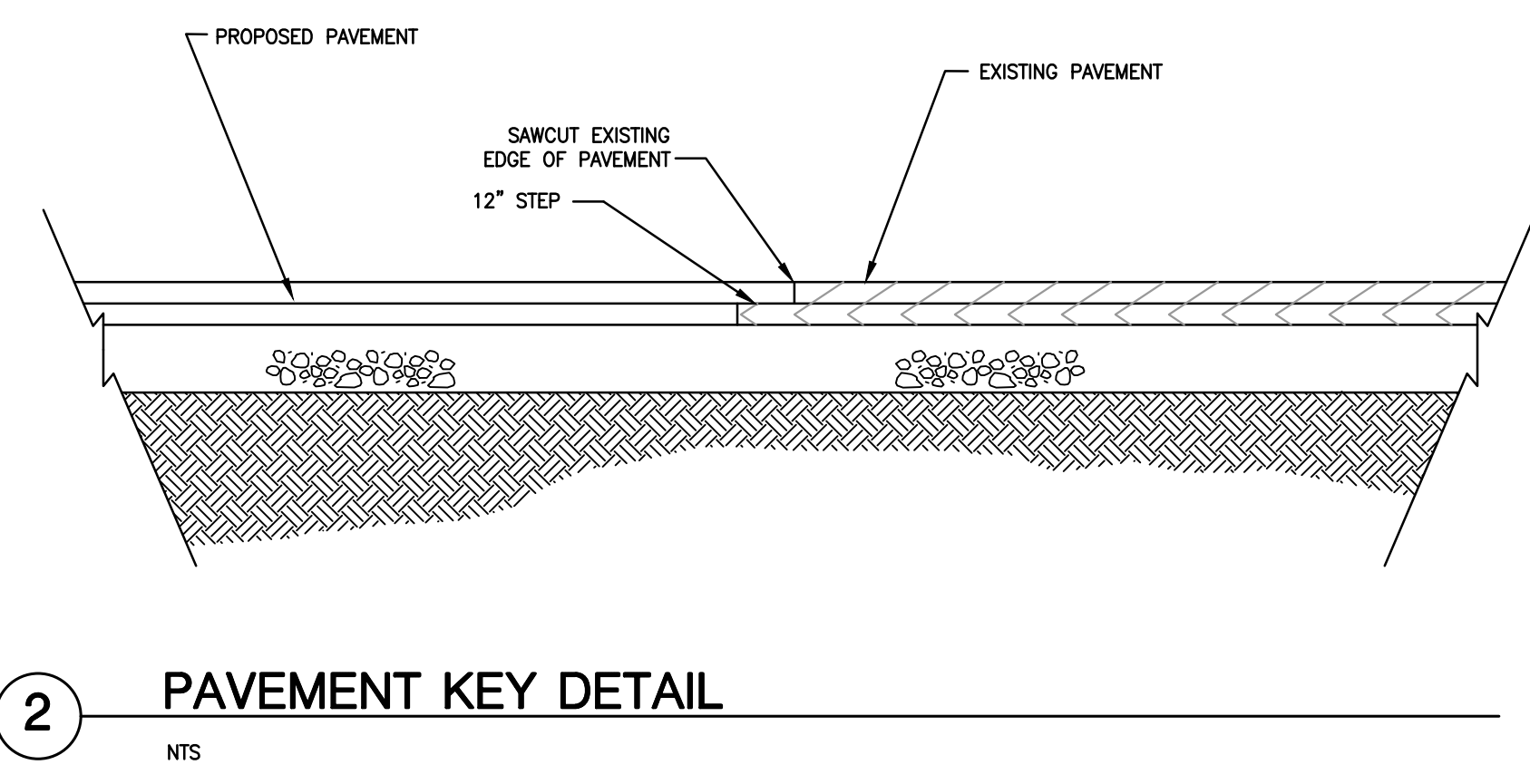
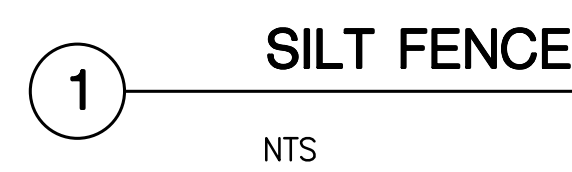
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CHECKED BY: SM

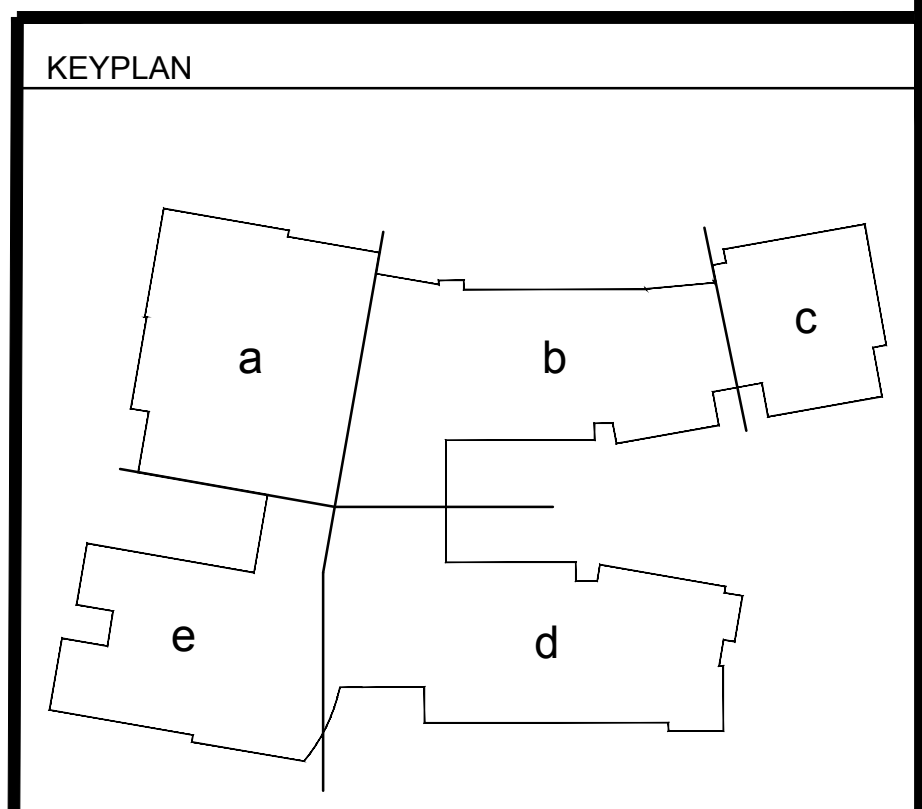
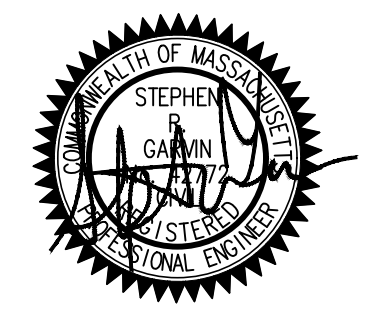
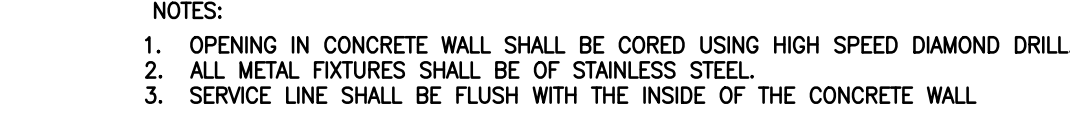
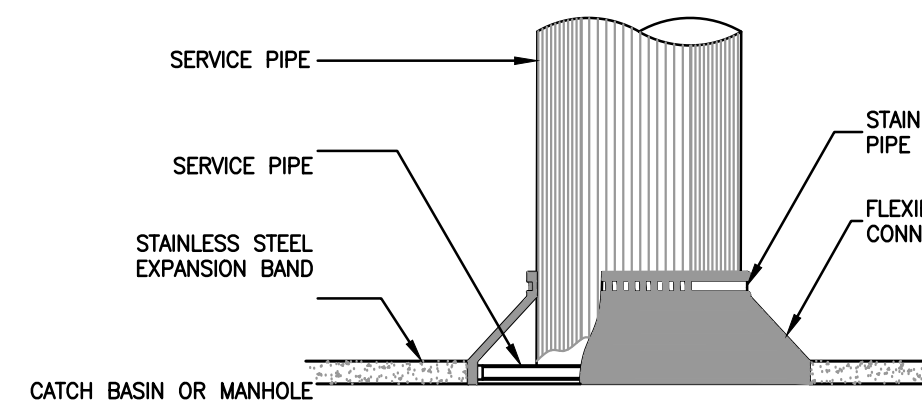
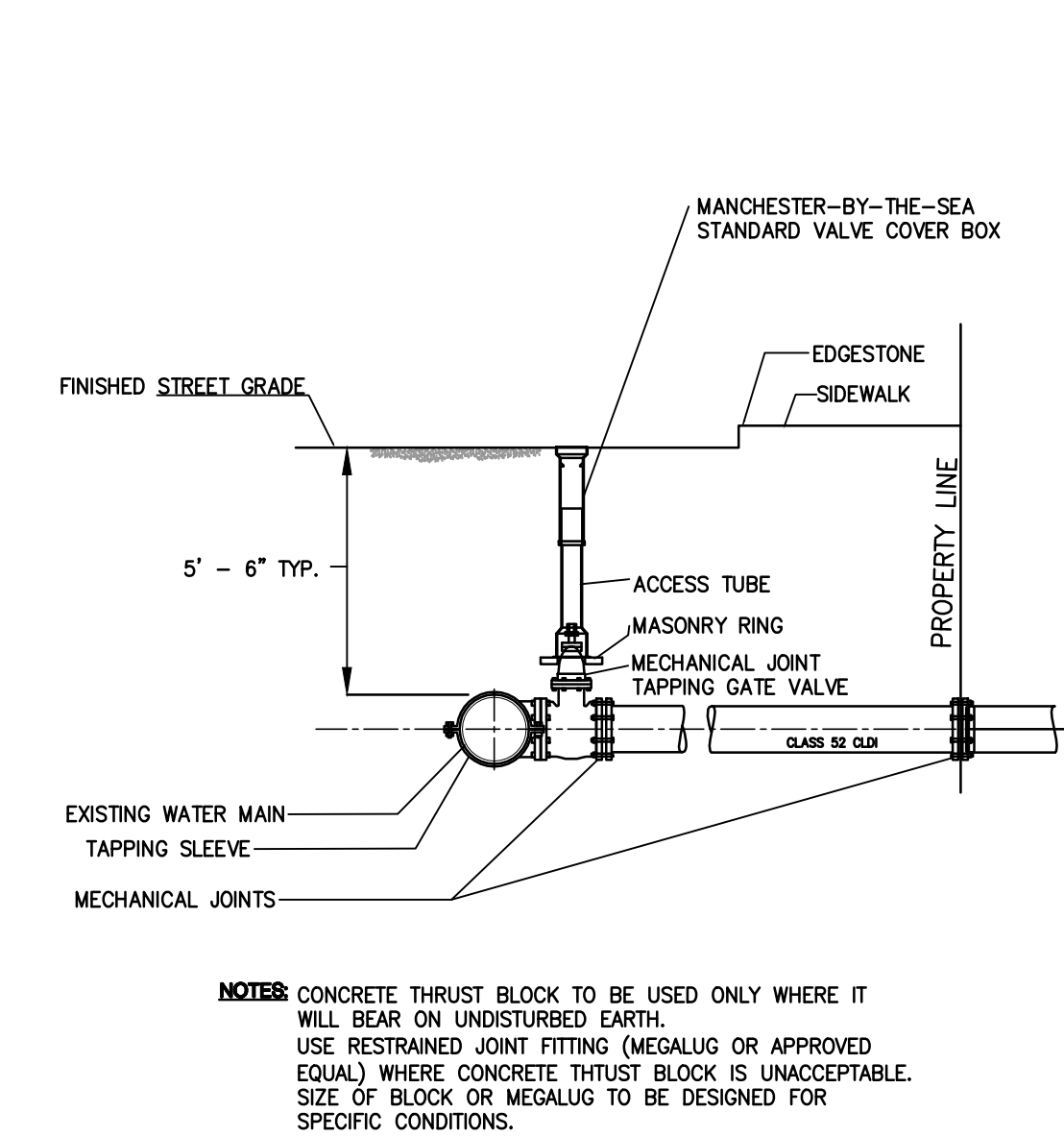
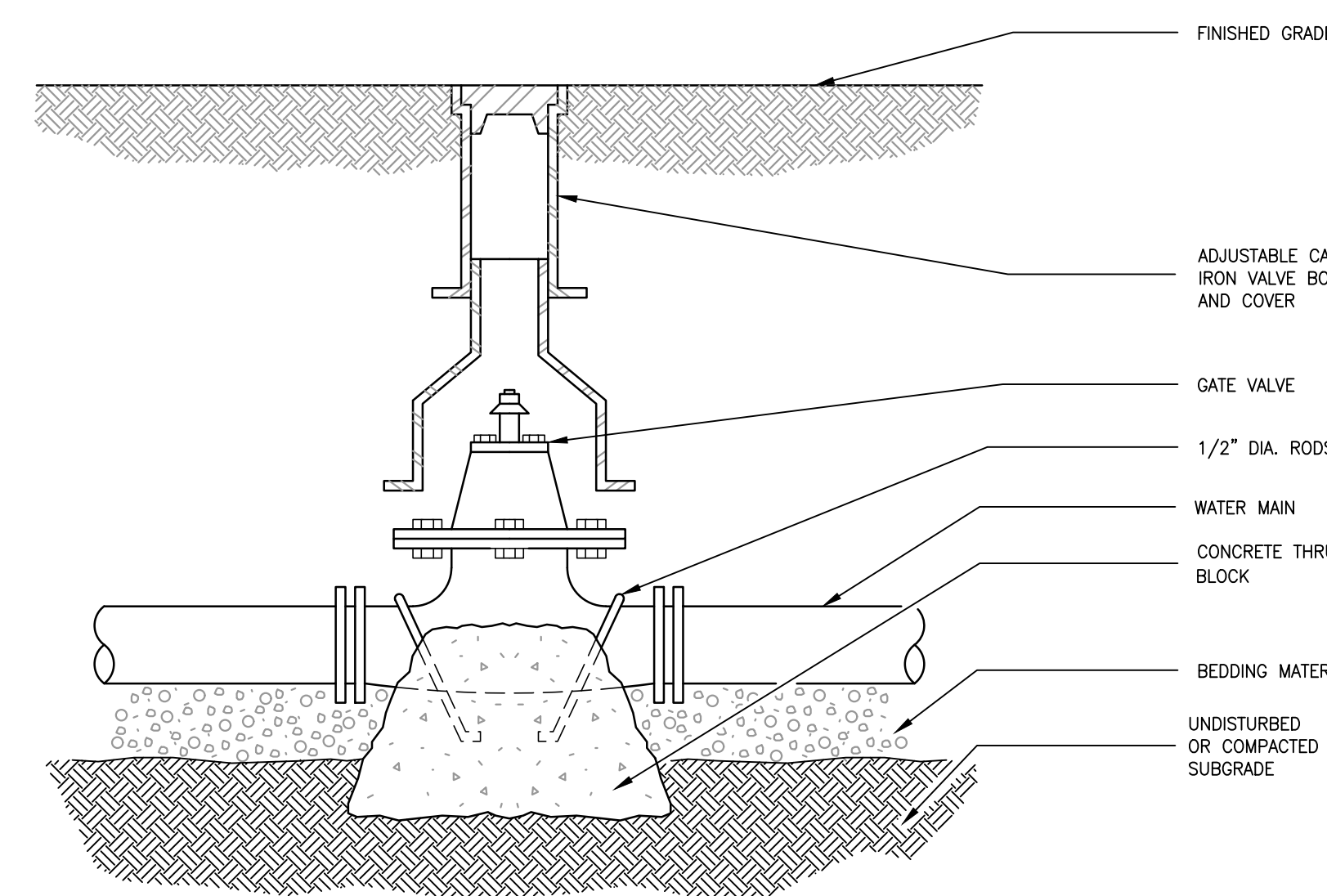
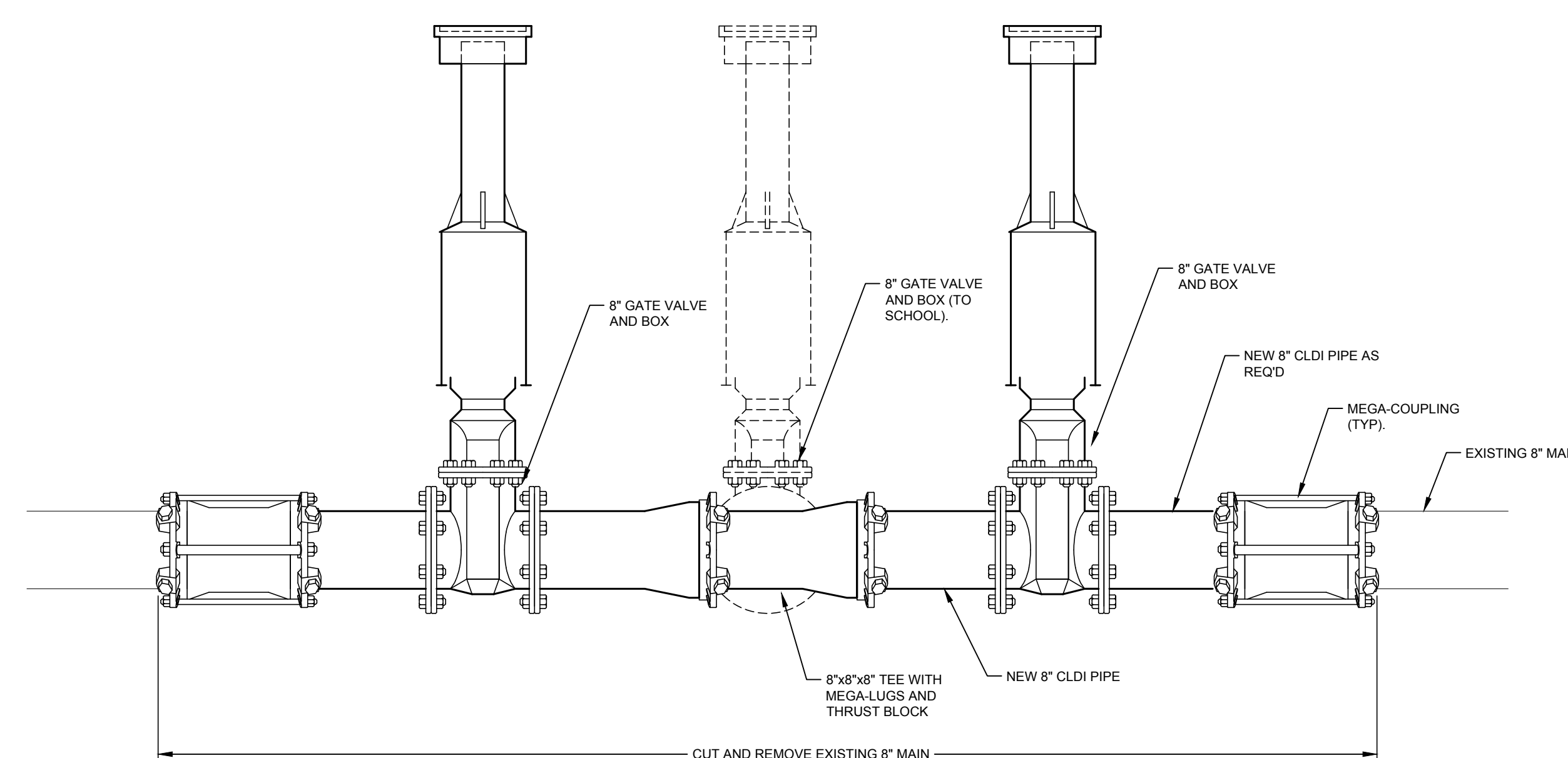
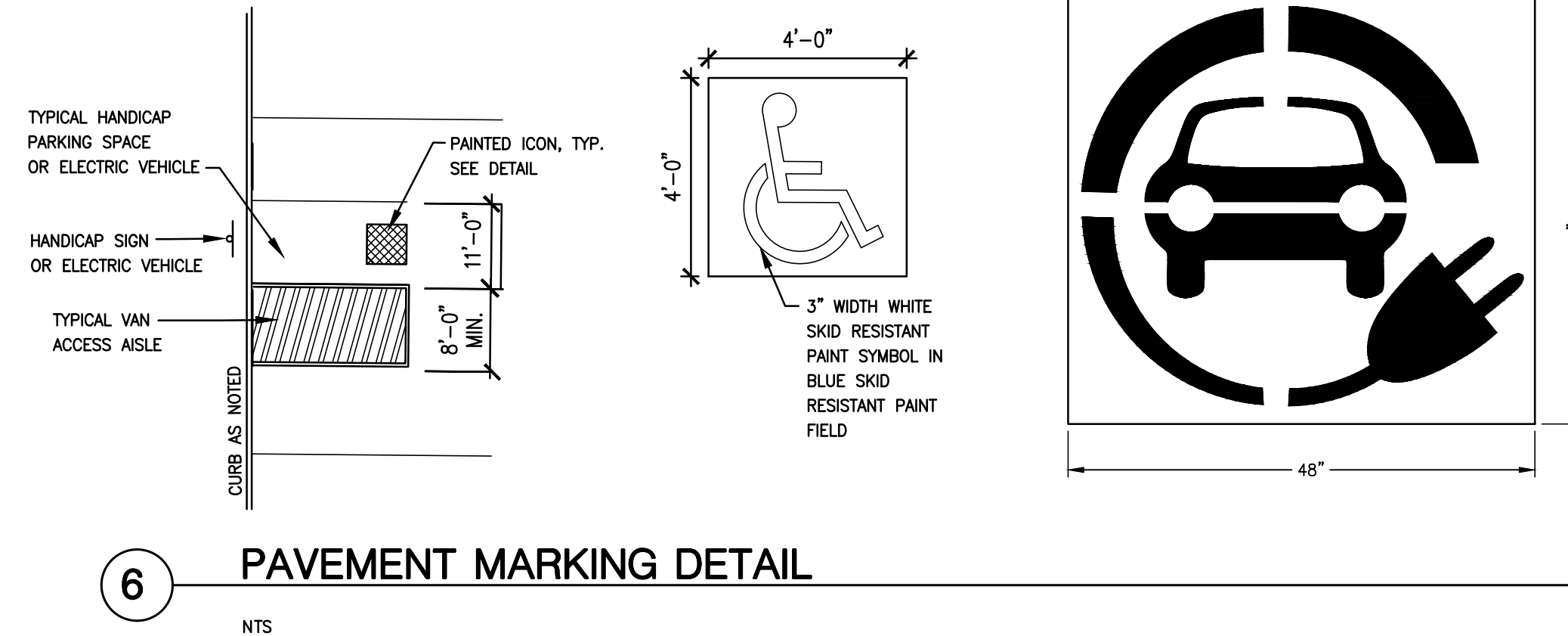
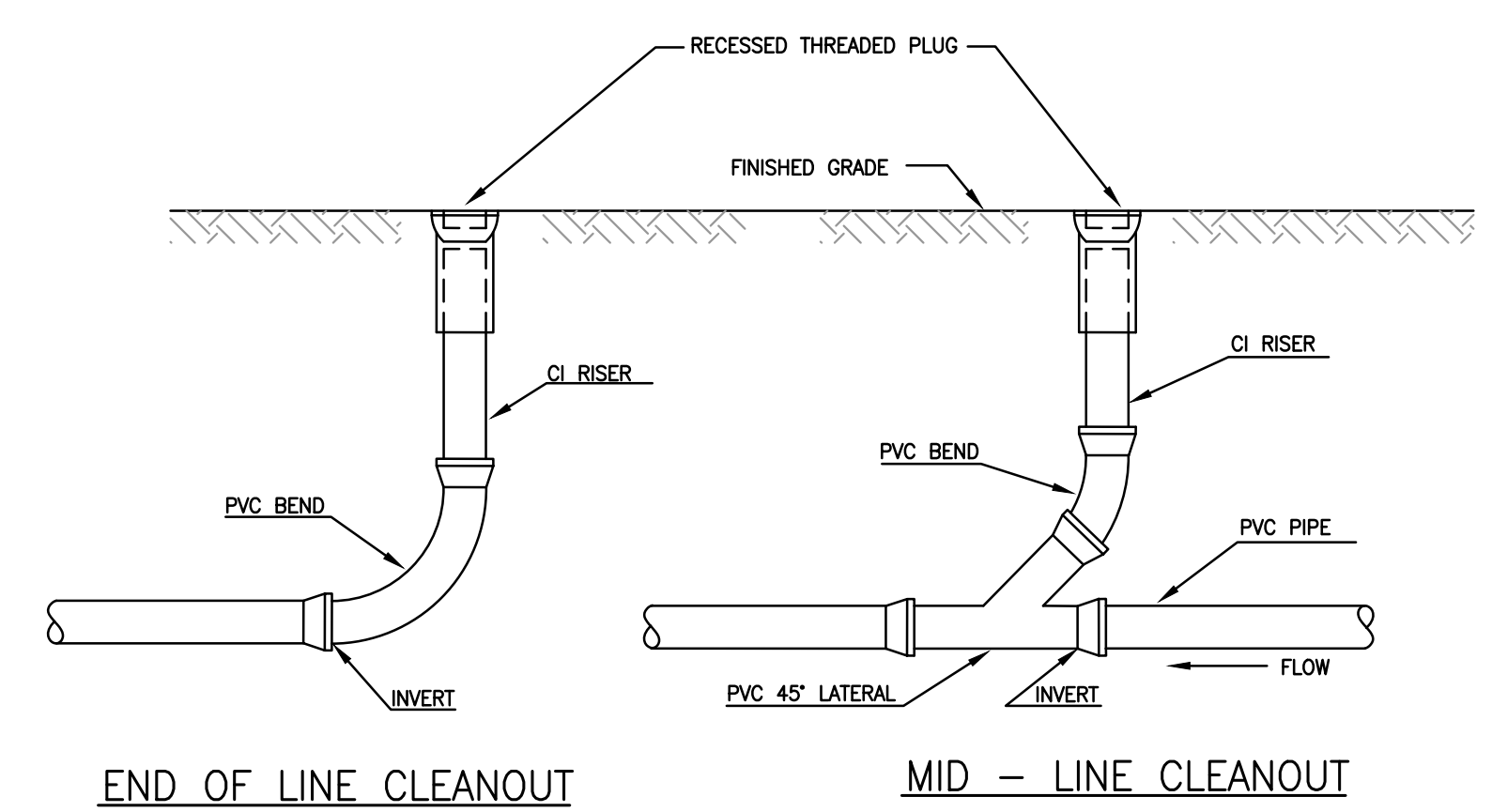
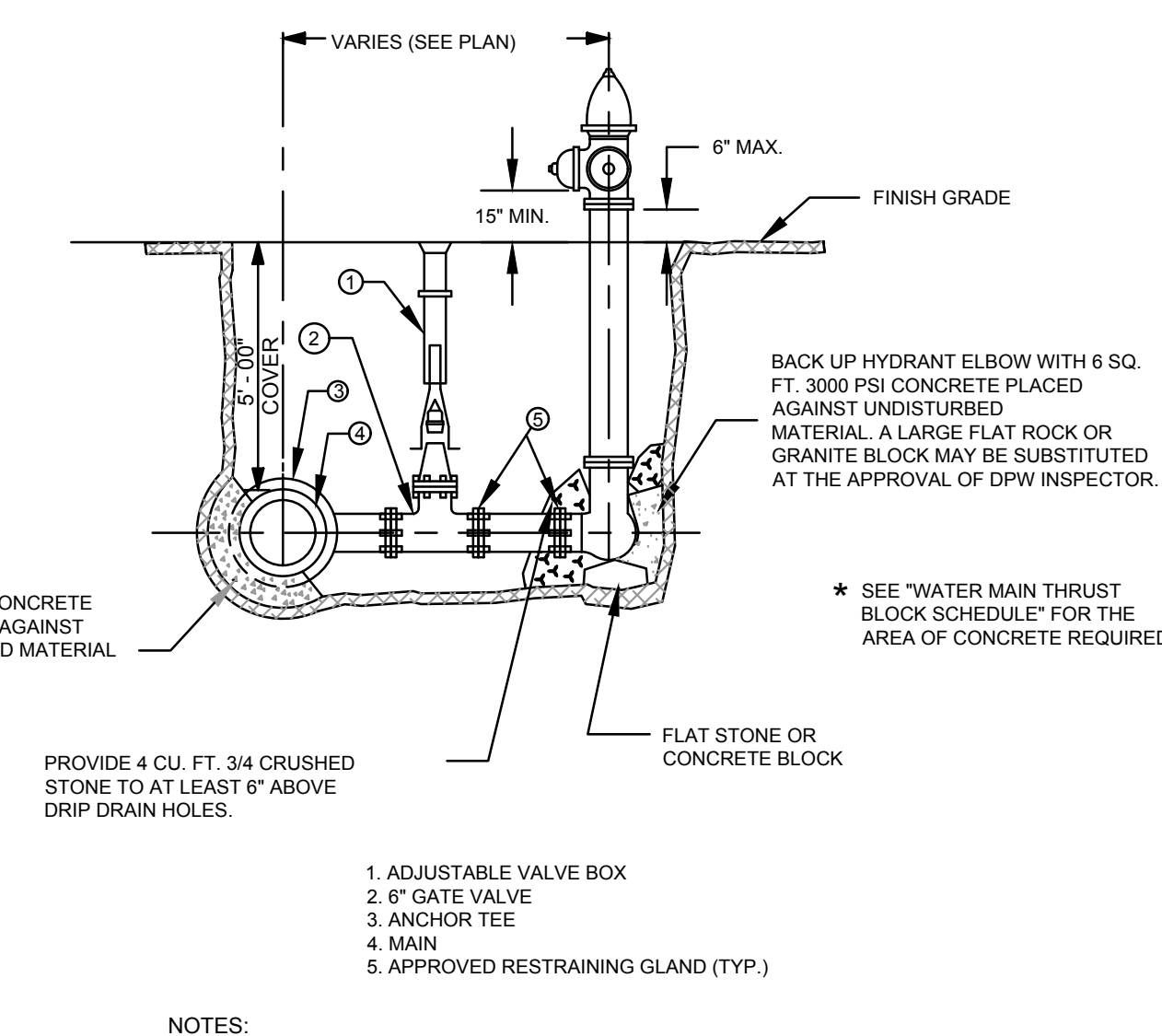
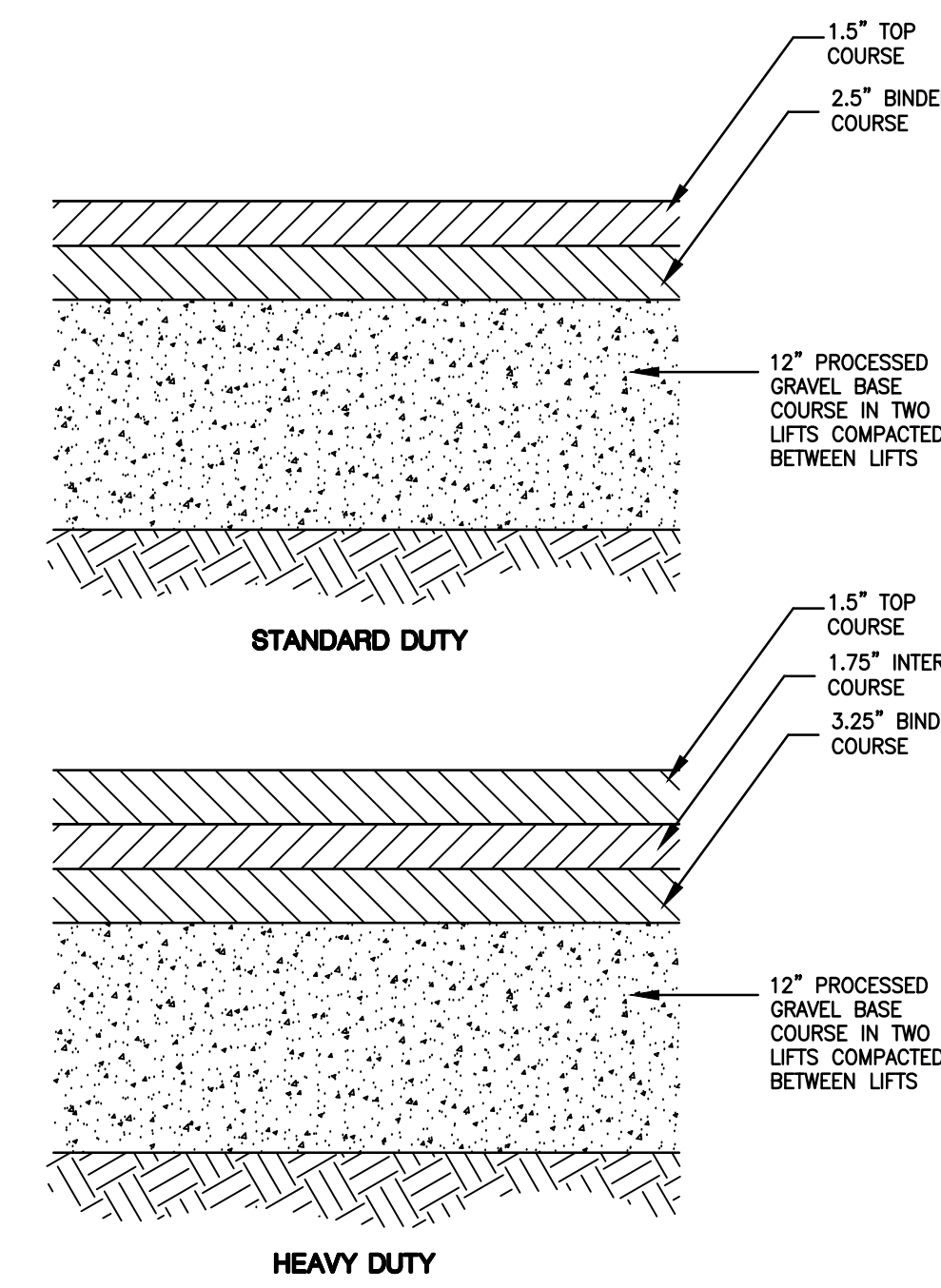
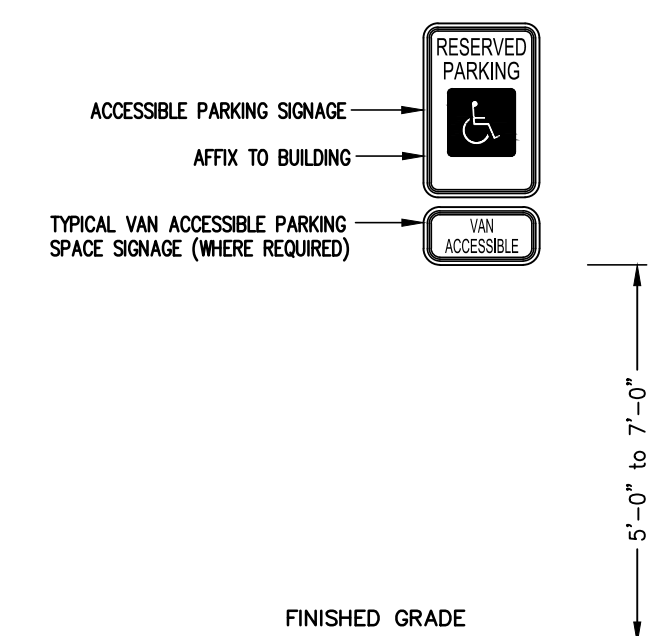
DRAWN BY: SM

17211

C-4.4



TRAFFIC CONTROL SIGNAGE SCHEDULE						
TEXT						
SEE MUTCD 2009 FOR TEXT DIMENSIONS AND COLORS						
R1-1	30"	30"	5.18		3	15.54
R7-8	12"	18"	1.50		3	4.50
R7-8P	18"	9"	1.13		1	1.13
R5-1	30"	30"	6.25		1	6.25
W11A-2	30"	30"	3.13		1	3.13
W16-7P	24"	12"	2.00		1	2.00

[illegible]

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
DETAILS SHEET

Arlington High School
Massachusetts Avenue, Arlington
DETAILS SHEET

C-5.0

JOB
NUMBER 17211

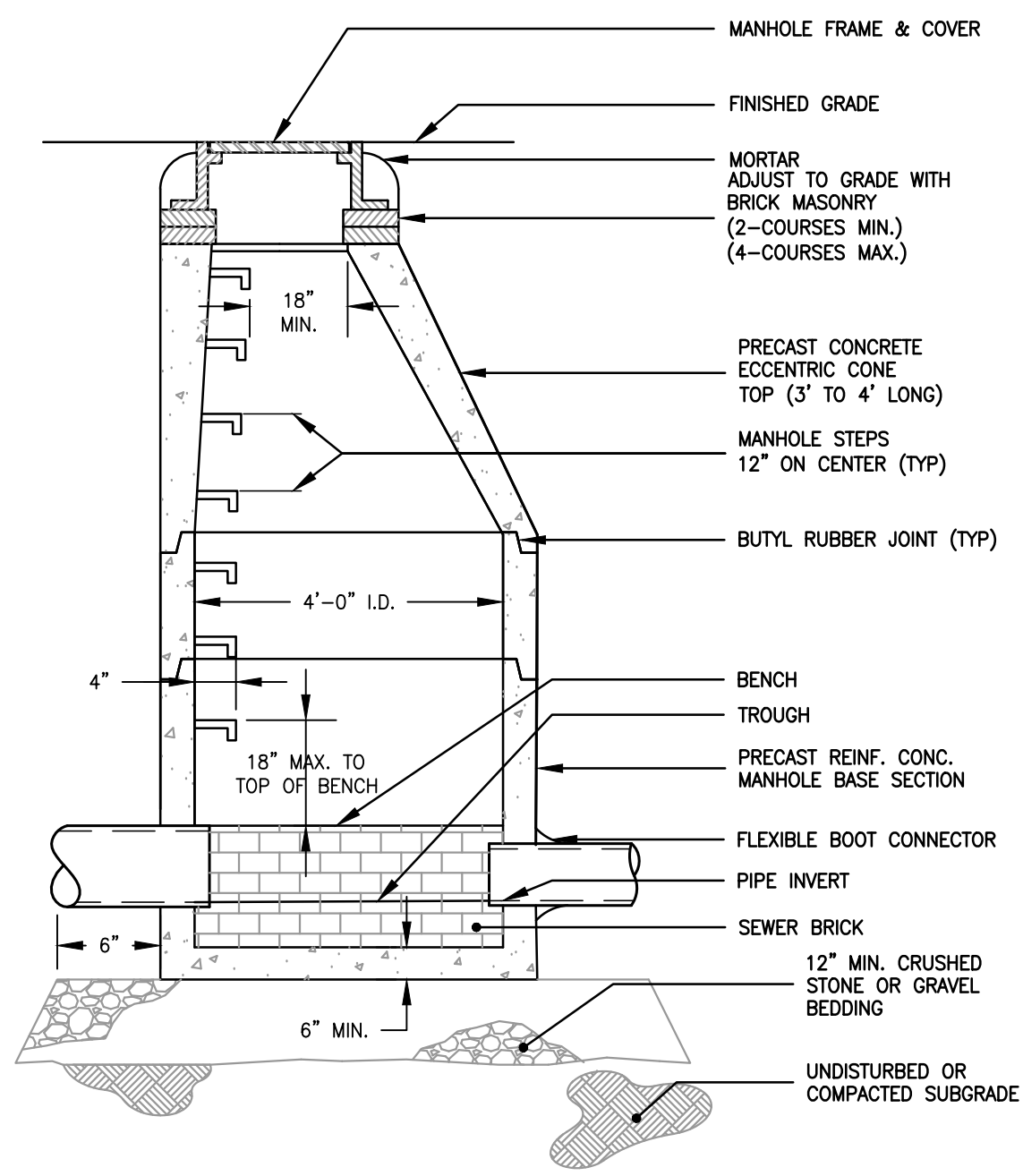
CONSERVATION COMMISSION FILING SET
05-07-2020

Samiotes Consultants Inc.
Civil Engineers + Land Surveyors
20 A Street
Framingham, MA 01701

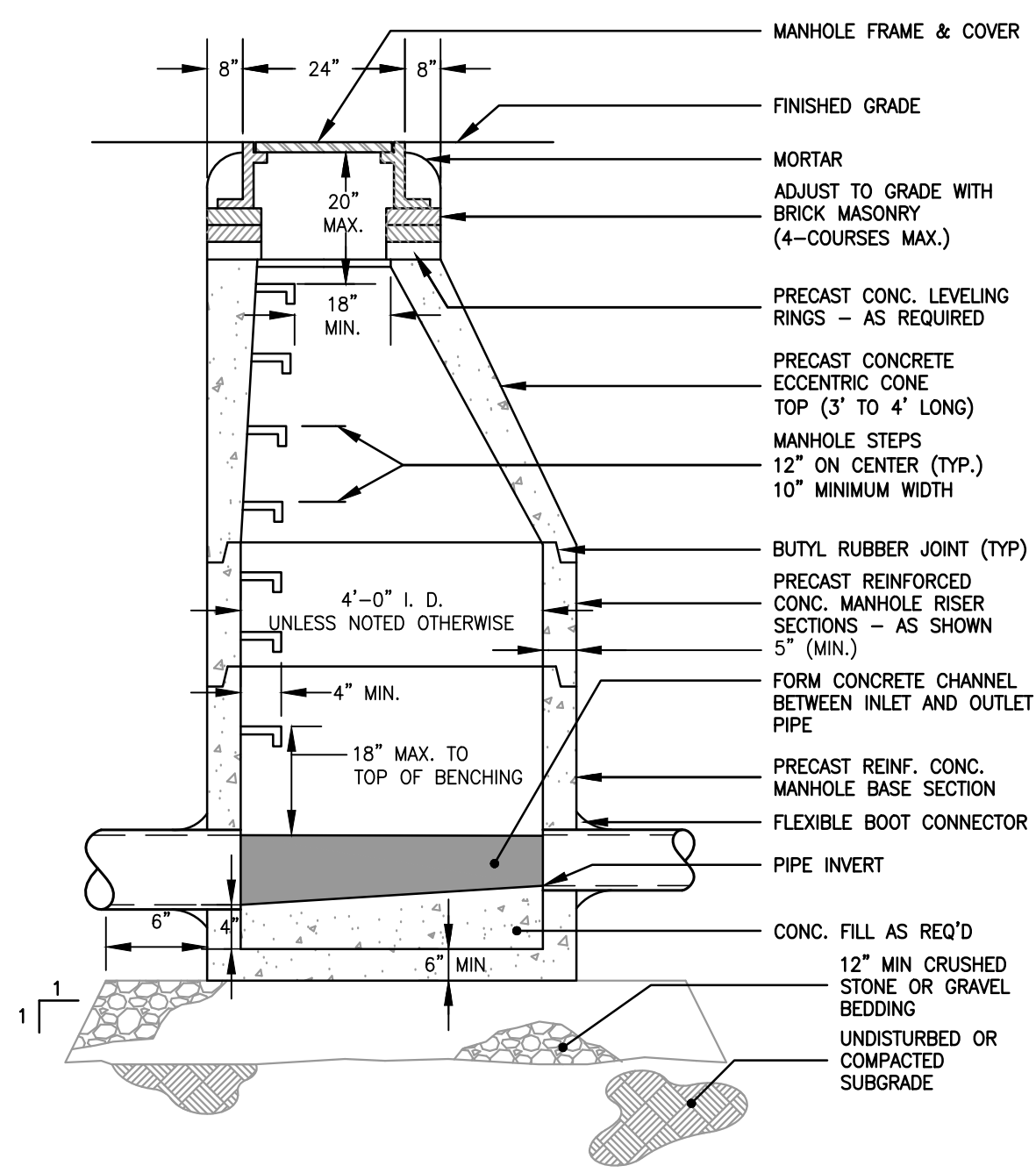
samiores

HMFH ARCHITECTS
130 Bishop Allen Drive
Concord, MA 02450

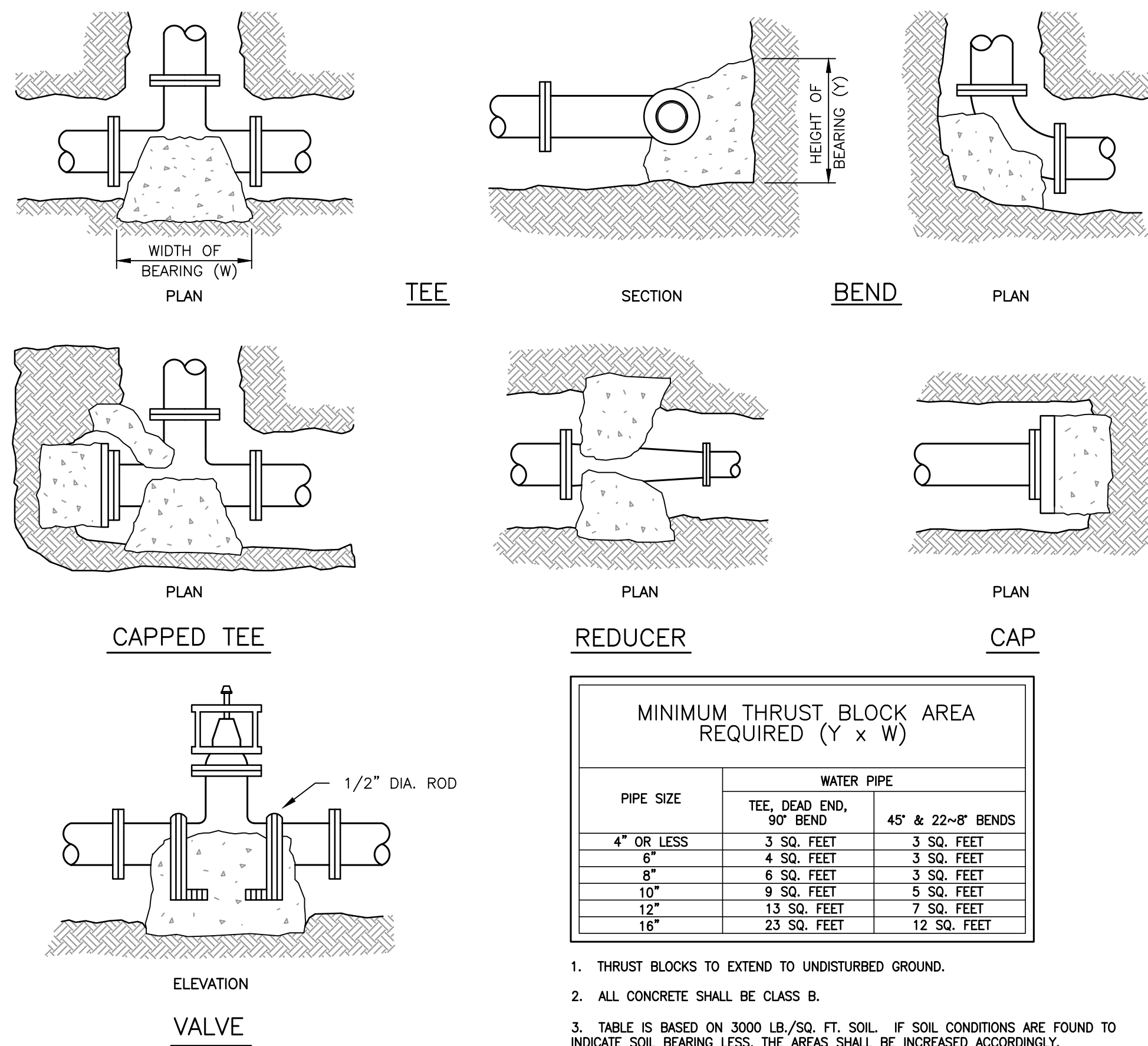
H	M
F	H



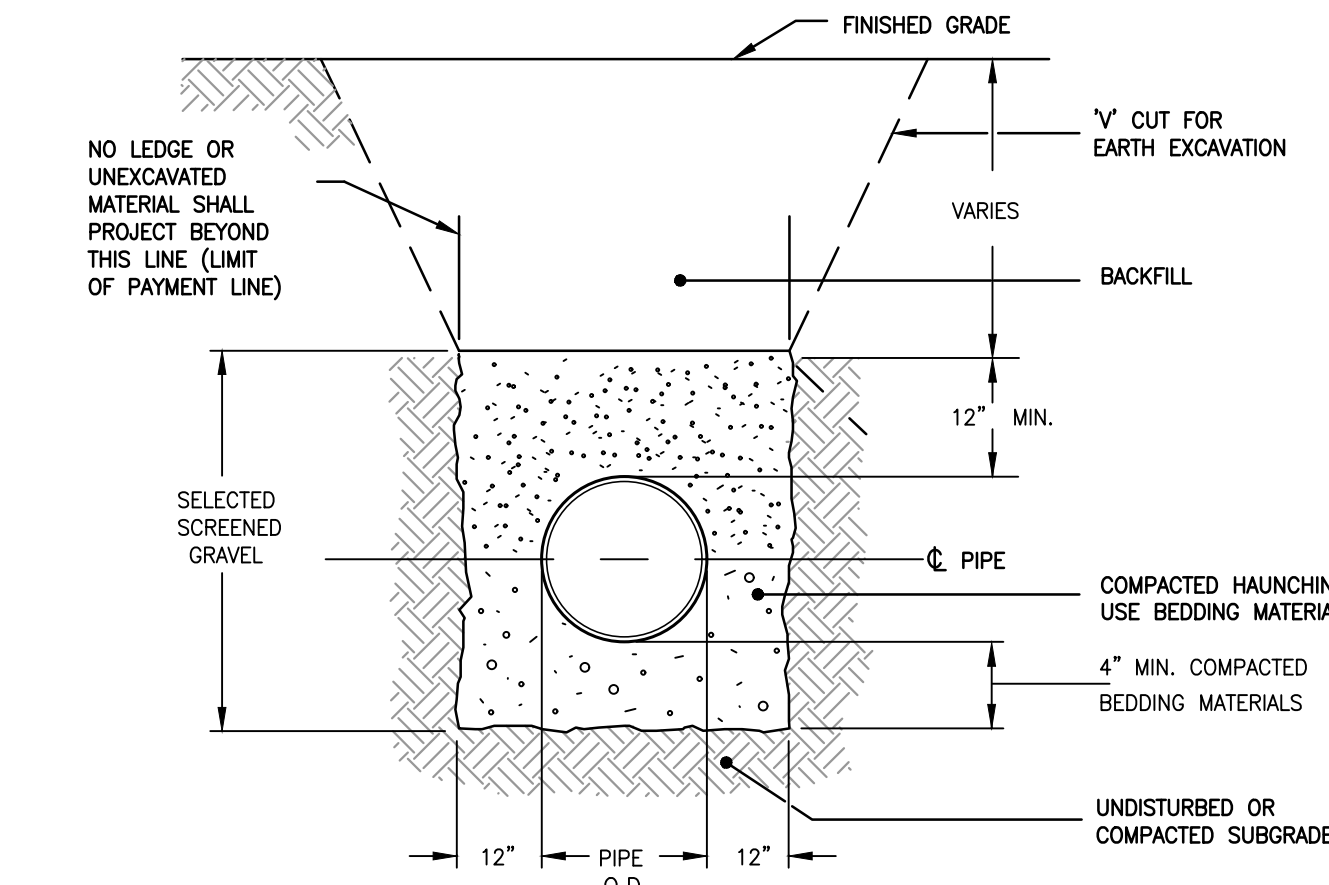
1 PRECAST SANITARY MANHOLE
NTS



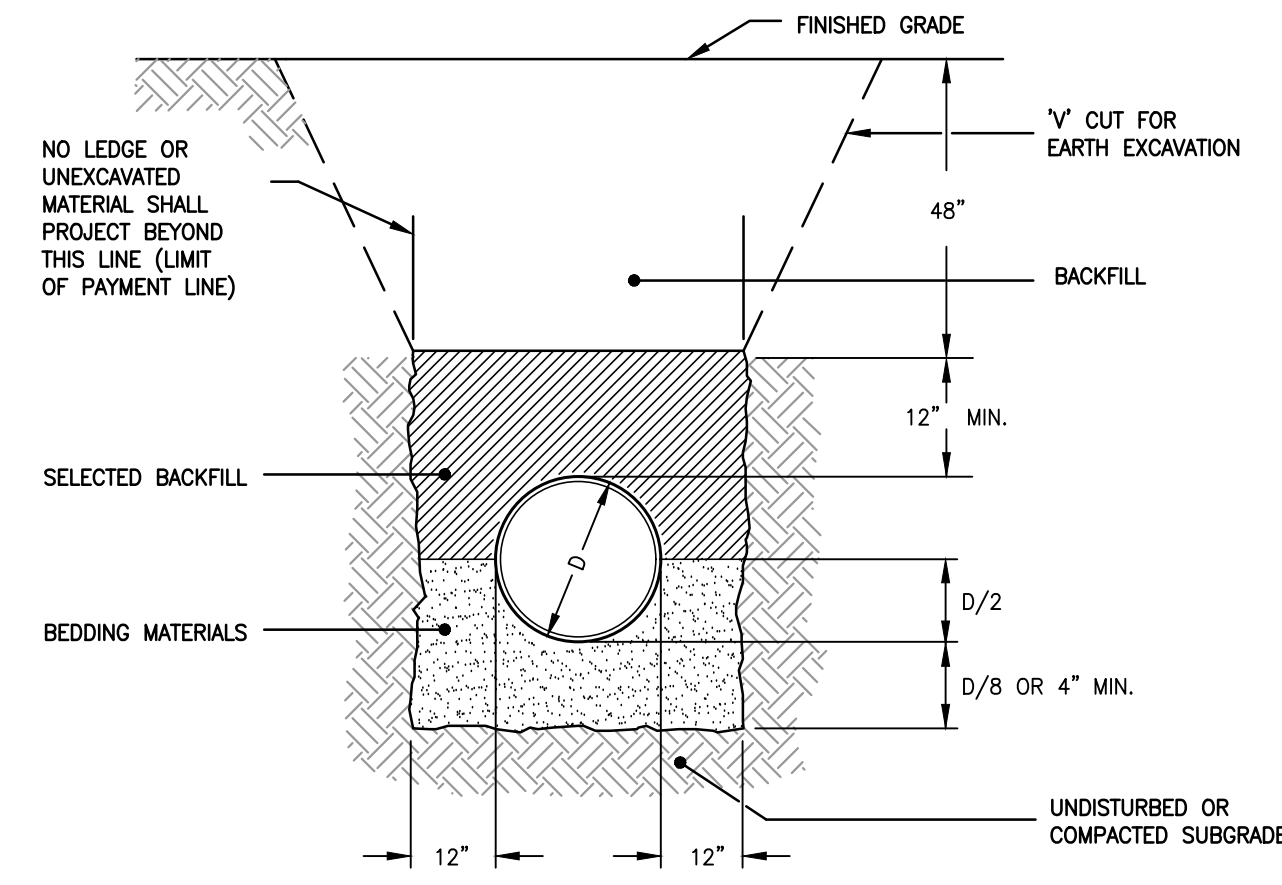
2 PRECAST STORM DRAIN MANHOLE
NTS



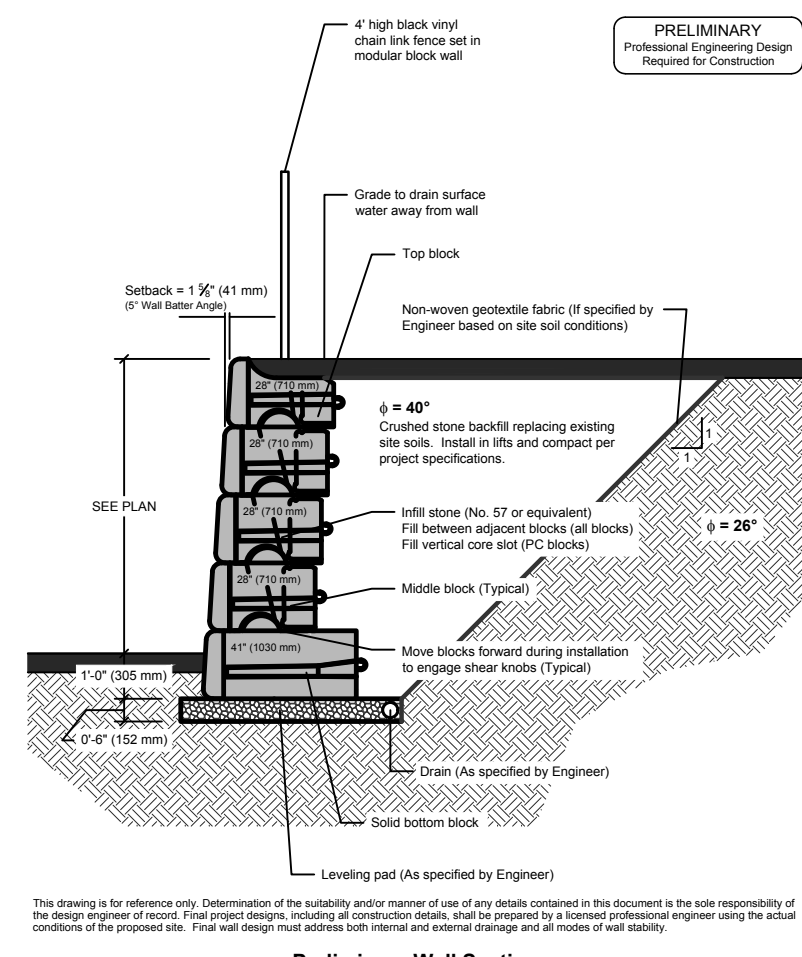
9 THRUST BLOCKS (WATER SYSTEM)
NTS



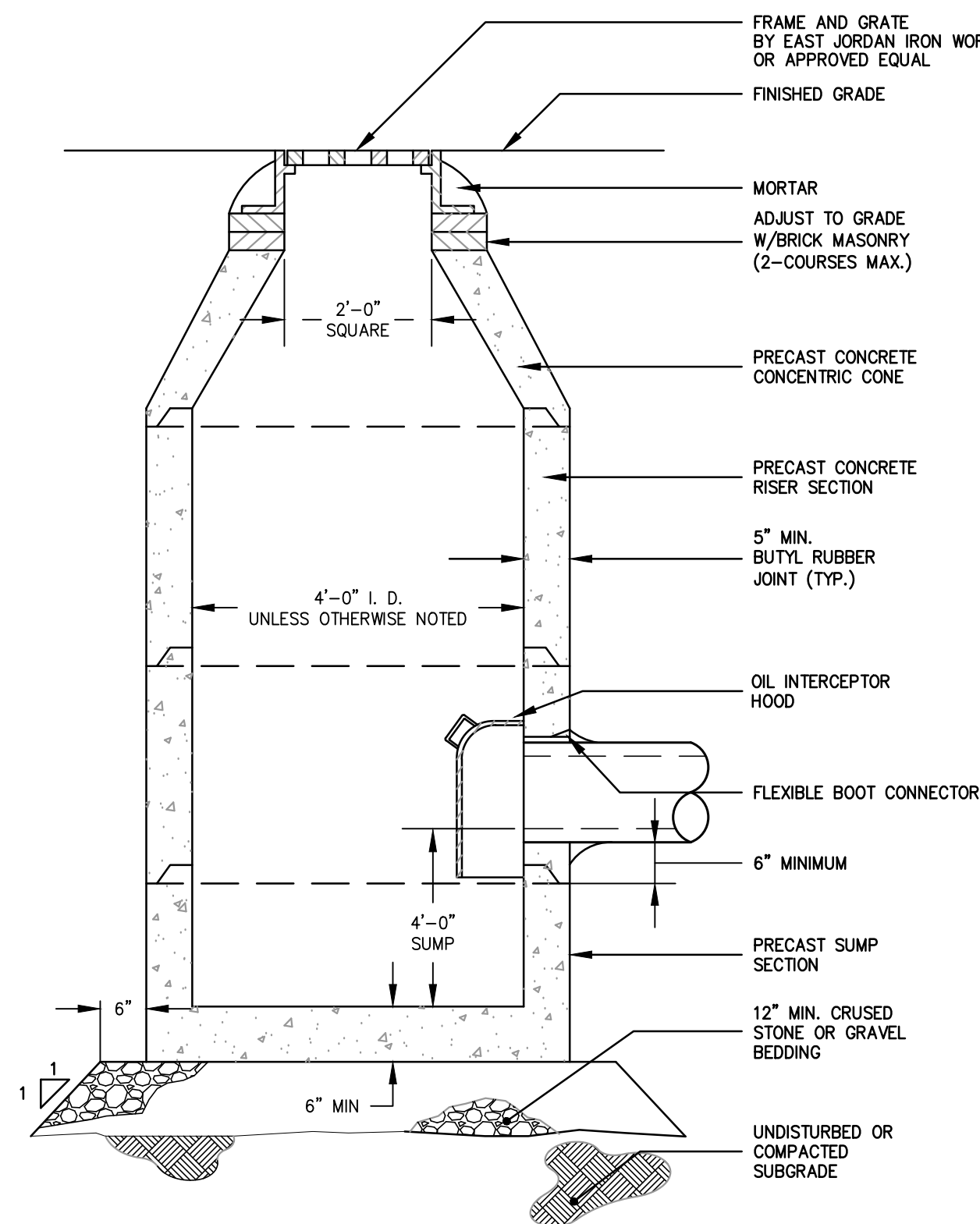
3 TRENCH SECTION- HDPE/PVC/CI GRAVITY PIPE
NTS



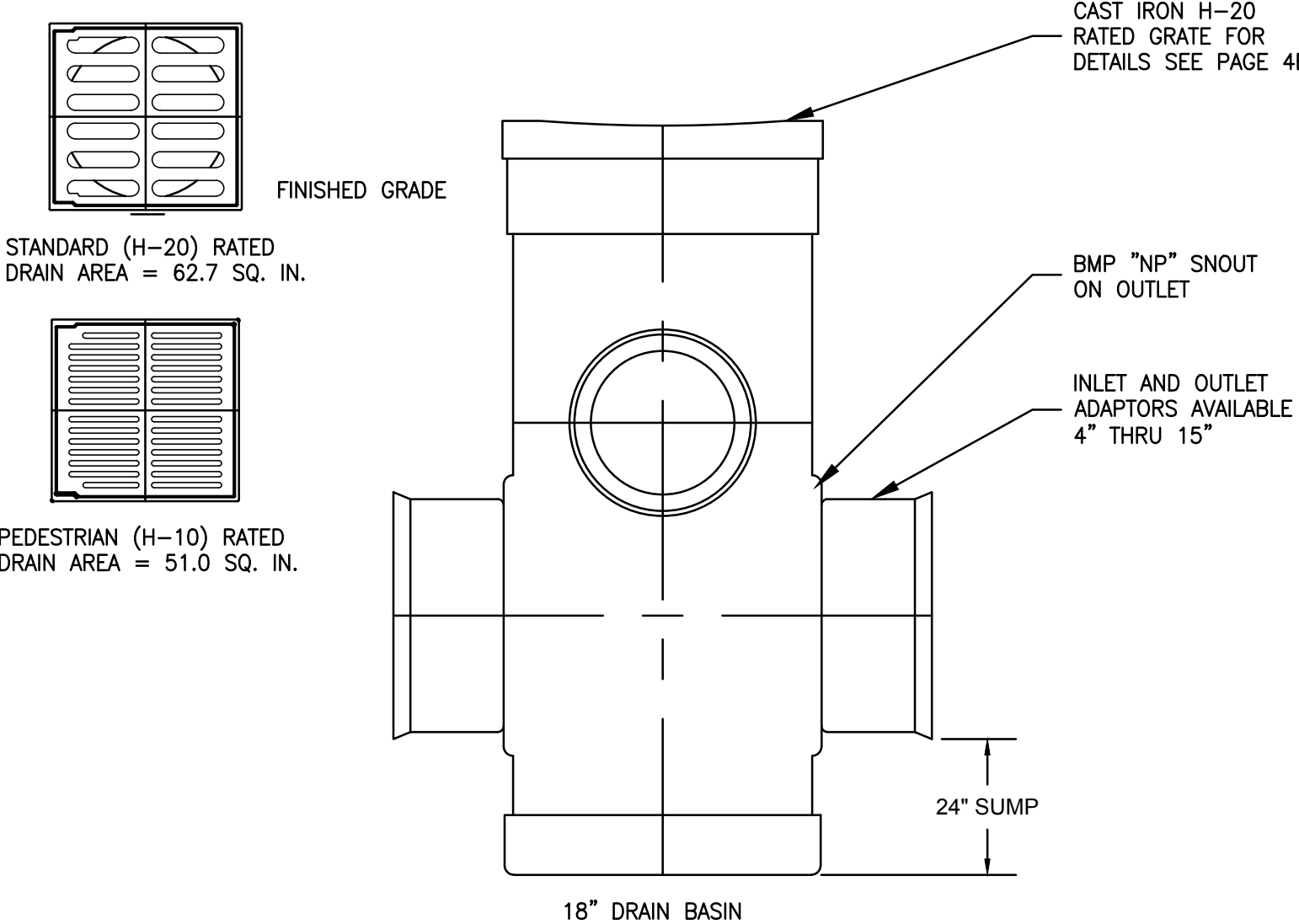
4 TRENCH SECTION - C.L.D.I. WATER PIPE
NTS



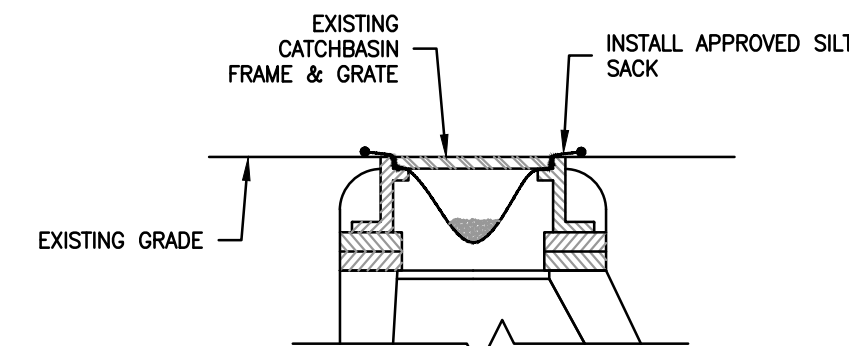
5 MODULAR BLOCK RETAINING WALL
NTS



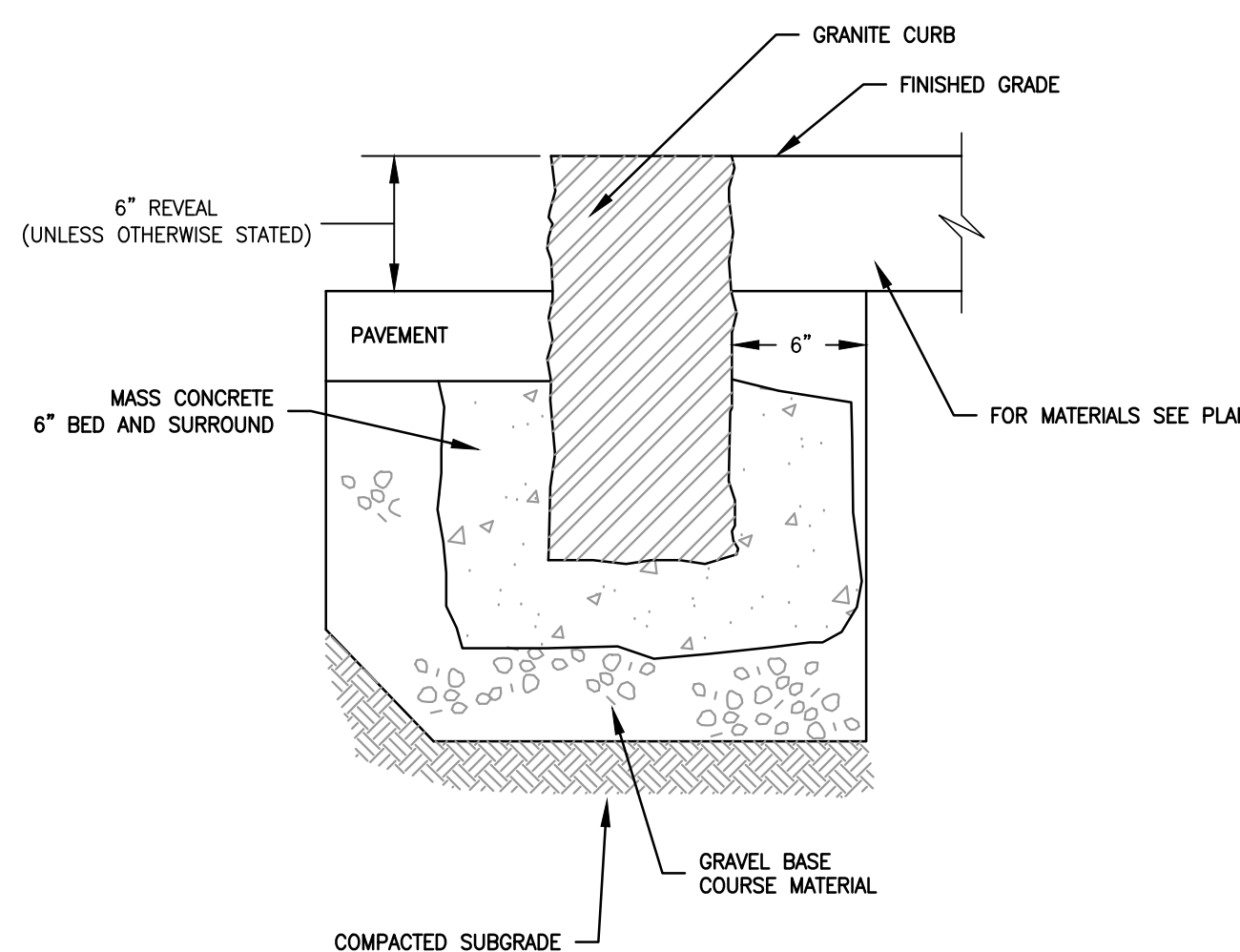
6 CATCH BASIN
NTS



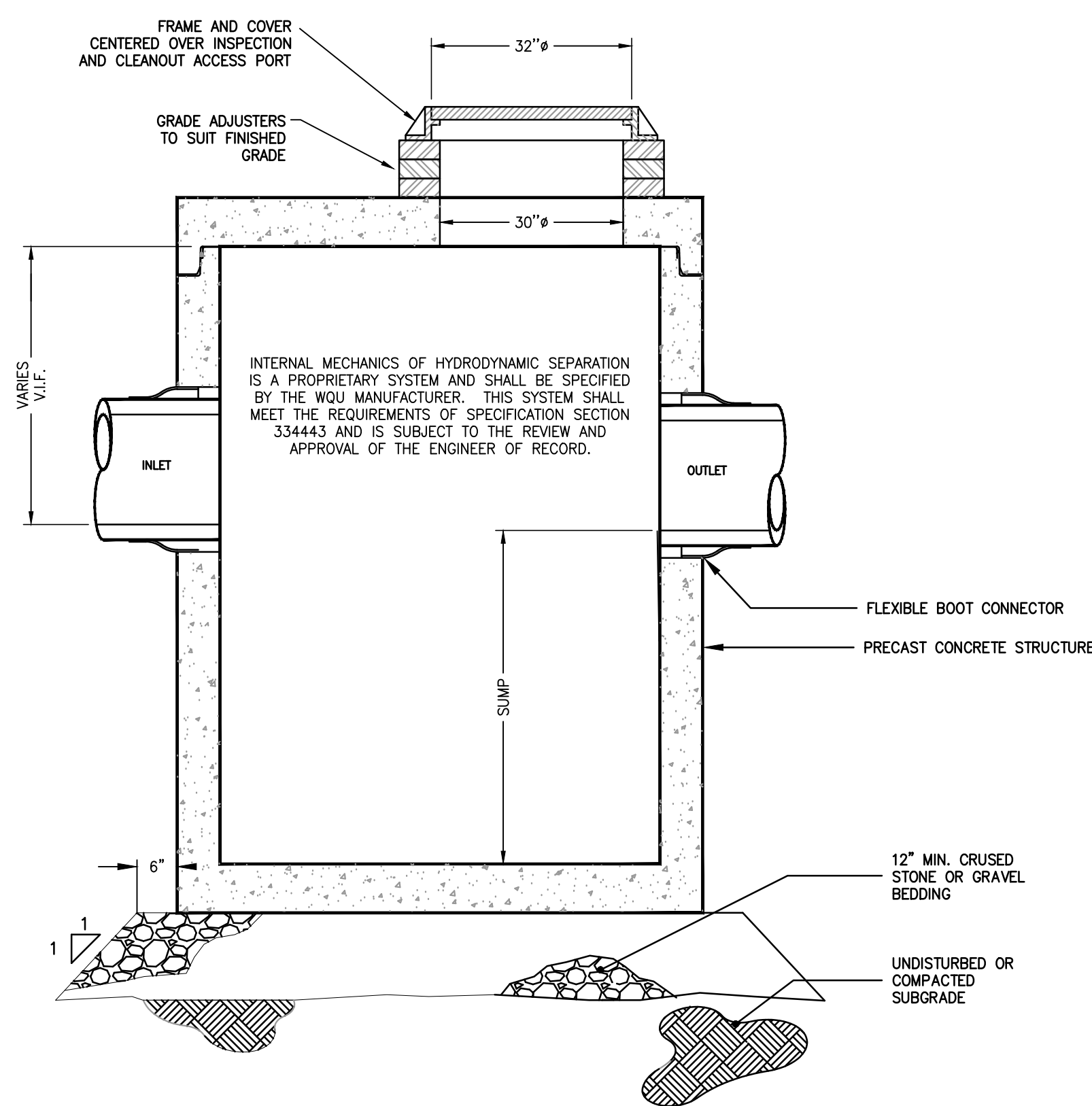
7 AREA DRAIN
NTS



8 CATCHBASIN W/ SILT SACK
NTS



9 VERTICAL GRANITE CURB
NTS

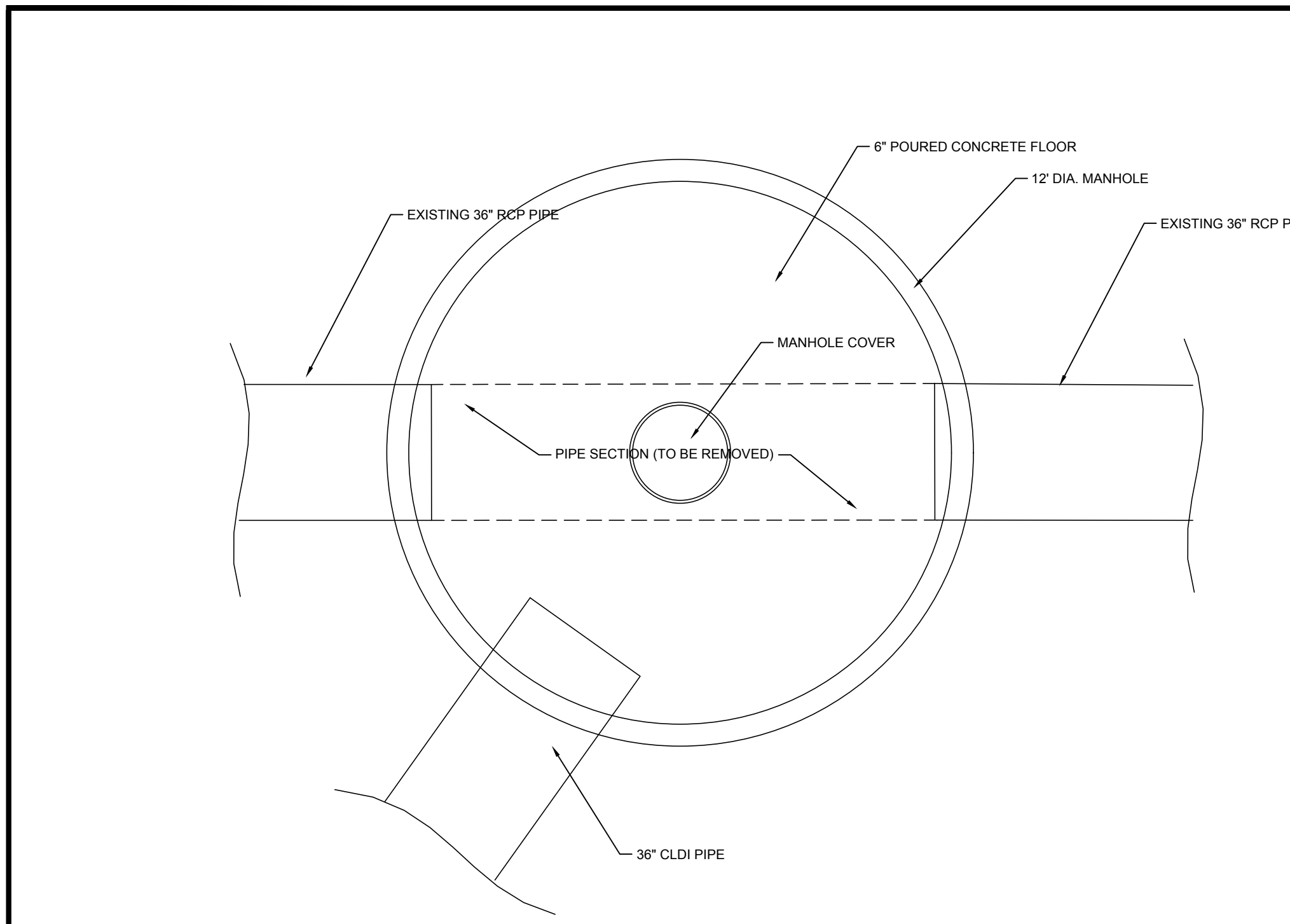


10 WATER QUALITY UNIT
NTS

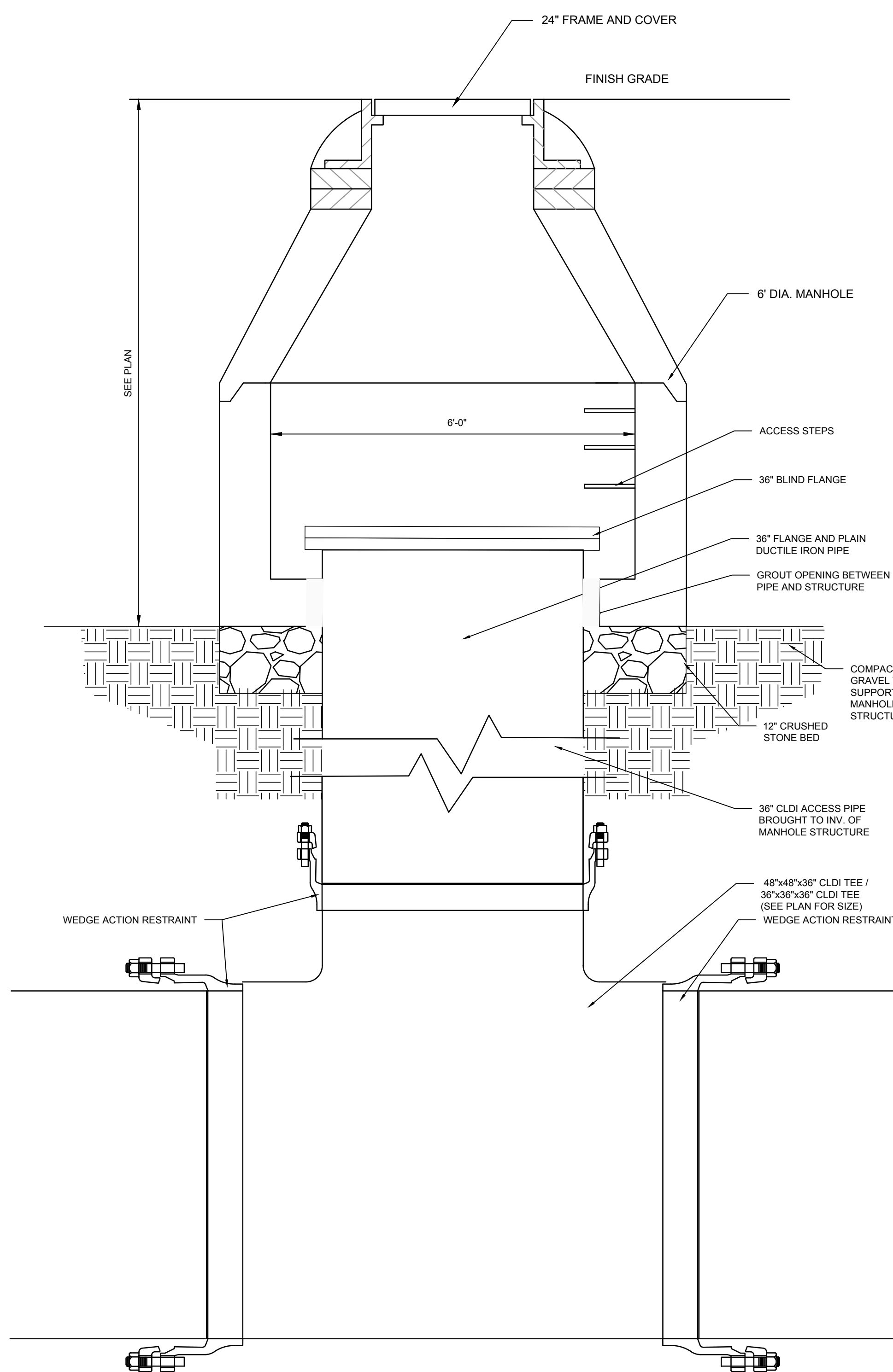


KEYPLAN			
REVISIONS NO.	DATE	REMARKS	BY

CONSERVATION COMMISSION FILING SET
05-07-2020
Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
DETAILS SHEET
SCALE: NTS
DRAWN BY: SM
CHECKED BY: SG
C-5.1
JOB NUMBER: 17211



1 SPECIAL "DOG HOUSE" STRUCTURE



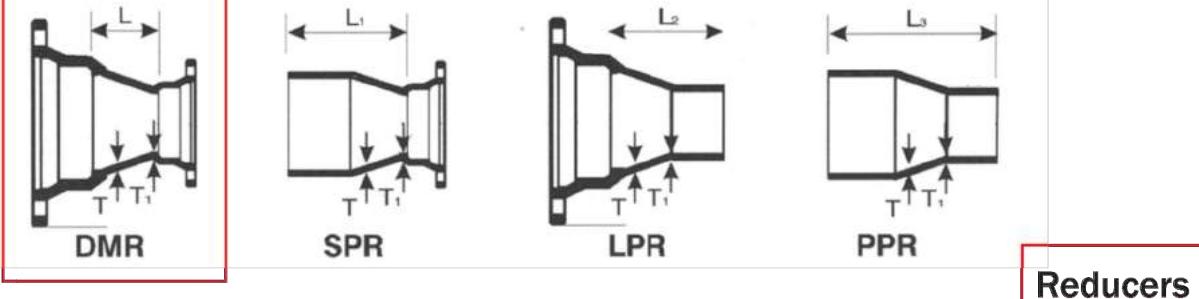
2 CLDI ACCESS POINT-48"

BLIND FLANGES									
Size	Weight	CAST IRON	Trapped	Ductile IRON	Trapped	O	Q	V	
2.5	9	BCF2.5	BT3	BDP2.5	DT3	7.00	0.89	0.48	
4	14	BCF4	BT4	BDP4	DT4	7.50	1.10	0.69	
6	24	BCF6	BT6	BDP6	DT6	8.00	1.34	0.88	
8	38	BCF8	BT8	BDP8	DT8	9.00	1.12	1.06	
10	59	BCF10	BT10	BDP10	DT10	10.00	1.38	1.12	
12	78	BCF12	BT12	BDP12	DT12	11.00	1.26	0.81	
14	110	BCF14	BT14	BDP14	DT14	12.00	1.38	1.08	
16	145	BCF16	BT16	BDP16	DT16	13.00	1.44	1.00	
18	185	BCF18	BT18	BDP18	DT18	14.00	1.58	1.06	
20	230	BCF20	BT20	BDP20	DT20	15.00	1.88	1.22	
24	370	BCF24	BT24	BDP24	DT24	16.00	1.98	1.22	
30	570	BCF30	BT30	BDP30	DT30	18.00	2.38	1.62	
36	770	BCF36	BT36	BDP36	DT36	20.00	2.78	1.82	
42	1170	BCF42	BT42	BDP42	DT42	22.00	3.38	2.00	
48	1585	BCF48	BT48	BDP48	DT48	24.00	3.78	2.20	
60	2600	BCF60	BT60	BDP60	DT60	26.00	4.38	2.56	
72						28.00	5.38	2.56	
78						30.00	5.38	2.56	
96						32.00	6.38	3.20	

C153 Mechanical Joint Compact Fittings

11-1/4 Degree Bends									
Size	Item No.	Wt.	A	Item No.	Wt.	A	B	T	
3	DWB111	1.00	1.00	DWB111	1.00	1.00	0.50	0.34	
4	DWB411	1.00	1.25	DWB411	1.00	1.25	0.50	0.34	
6	DWB611	1.00	1.50	DWB611	1.00	1.50	0.50	0.34	
8	DWB811	1.00	1.75	DWB811	1.00	1.75	0.50	0.34	
10	DWB1011	1.00	2.00	DWB1011	1.00	2.00	0.50	0.40	
12	DWB1211	1.00	2.25	DWB1211	1.00	2.25	0.50	0.40	
14	DWB1411	1.00	2.50	DWB1411	1.00	2.50	0.50	0.47	
16	DWB1611	1.00	2.75	DWB1611	1.00	2.75	0.50	0.50	
18	DWB1811	1.00	3.00	DWB1811	1.00	3.00	0.50	0.54	
20	DWB2011	1.00	3.25	DWB2011	1.00	3.25	0.50	0.57	
24	DWB2411	1.00	3.75	DWB2411	1.00	3.75	0.50	0.61	
30	DWB3011	1.00	4.75	DWB3011	1.00	4.75	0.50	0.66	
36	DWB3611	1.00	5.00	DWB3611	1.00	5.00	0.50	0.74	
42	DWB4211	1.00	5.00	DWB4211	1.00	5.00	0.50	0.82	
48	DWB4811	1.00	5.00	DWB4811	1.00	5.00	0.50	0.90	

C153 Mechanical Joint Compact Fittings



3 CLDI MJ FITTINGS

ONE-LOK™ Series SLDE for Ductile Iron Pipe



Features & Advantages:

- The SIGMA ONE-LOK Series SLDE is a mechanical joint restraining gland that implements a series of individually activated wedges into the mechanical joint follower gland. When the wedge segment is engaged by the actuating bolt, the primary contact edges of each wedge segment lock onto the pipe wall. This action causes the primary contact edges to grip the pipe and effectively restrain all classifications of ductile iron pipe.
- ONE-LOK SLDE's precision contoured wedges provide proper contact and support of the ductile iron pipe wall. Each wedge is manufactured with an elongated contour that evenly matches the outside circumference of each nominal diameter of ductile iron pipe. This elongated contour also eliminates the concern of damage to both the pipe wall and the interior cement mortar lining caused by point loading, even on the thinner pressure classes of ductile iron pipe.
- ONE-LOK SLDE's wedge actuating bolt provides the installer with a visual torque indicator. The breakaway top ensures proper engagement of the wedge segment at the time of installation. Unlike other actuating bolts, the ONE-LOK SLDE is manufactured with a proprietary quality control system that ensures the breakaway tops will activate at the correct torque. The breakaway top is sized to match the same dimensions of the bolts and nuts used to assemble the mechanical joint fitting and follow gland, eliminating the need for special installation tools. Once engaged, the actuating bolt leaves a residual hex-head mark, allowing post-installation disassembly of the restrained joint, if necessary.
- ONE-LOK SLDE's unique wedge segment and actuating bolt design allows the two components to interface using a cam action principle, allowing the wedge segments to rock and increase their grip on the pipe wall as thrust on the assembled joint increases. This also allows improved resistance to subsidence, seismic forces, and other movement within the maximum deflection limitations of the mechanical joint under applicable AWWA standards.

4 CLDI MJ WEDGE ACTION RESTRAINTS

C153 Mechanical Joint Compact Fittings

3-48" Ductile Iron Mechanical Joint Fittings Class 350

MATERIAL: Ductile Iron ASTM A536

PRESSURE: 350PSI WATER WORKING PRESSURE (CLASS 350) 3" - 24" & 250 PSI 30" - 48"

TESTING: In accordance with ANSI / AWWA C153 / A21.53 & UL - FM requirements

LAYING LENGTH: Short body design - straight section of body deleted to provide a compact and lighter fitting without reducing strength or flow characteristics, in accordance with ANSI / AWWA C153 / A21.53

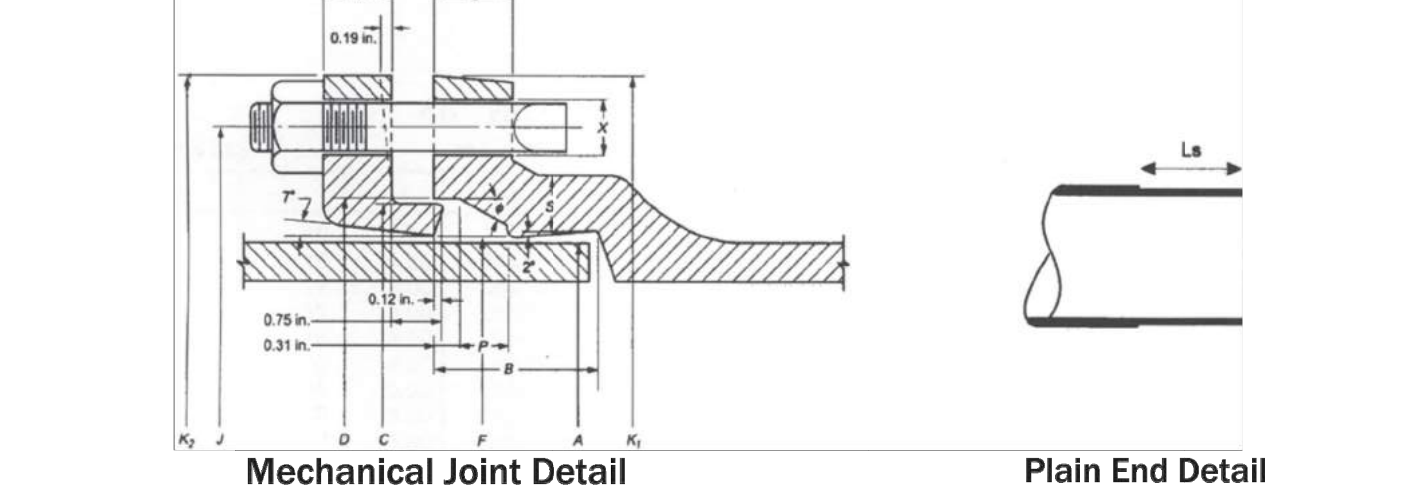
CEMENT LINING: In accordance with ANSI / AWWA C104 / A21.4 COATING: Tar coated (bituminous) inside and out in accordance with ANSI / AWWA C104 / A21.4

GASKETS: SBR in accordance with ANSI / AWWA C111 / A21.11

T-BOLTS: Low Alloy corrosion resistant high strength steel in accordance with ANSI / AWWA C111 / A21.11

APPROVALS: 3" - 16" Underwriters Laboratories listed and Factory Mutual Approved.

STANDARDS: Certified to NSF61 Standard ANSI / AWWA C153 / A21.53 for Compact Ductile Iron Fittings 3"-48" for water and other liquids.





Size	A	B	C	D	F	J	K1	K2	L	M	P	S	X	No	Size	Len	Ls
3	4.80	2.50	4.84	4.84	4.08	6.19	7.62	7.69	0.58	0.62	0.63	0.39	3/4	4	3/8	3.0	5.5
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	0.60	0.75	0.75	0.43	7/8	6	3/4	3.5	5.5
6	6.50	2.50	8.02	8.12	7.00	9.50	11.06	11.12	0.63	0.88	0.75	0.43	7/8	6	3/4	3.5	5.5
8	8.06	2.50	10.32	10.37	9.15	11.75	13.31	13.37	0.66	1.14	0.75	0.43	7/8	6	3/4	3.5	5.5
10	11.10	2.50	12.32	12.34	11.20	14.00	15.62	15.62	0.70	1.00	0.75	0.47	7/8	8	3/4	3.5	5.5
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	0.73	1.00	0.75	0.48	7/8	12	3/4	3.5	5.5
14	15.40	3.50	16.40	16.53	15.40	18.50	20.25	20.25	0.76	1.25	0.75	0.69	7/8	14	3/4	4.0	8.0
16	17.40	3.50	18.50	18.64	17.54	21.00	22.50	22.50	0.89	1.31	0.75	0.78	7/8	12	3/4	4.0	8.0
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	0.75	0.68	7/8	12	3/4	4.0	8.0
20	21.60	3.50	22.70	22.84	21.60	25.50	27.08	27.00	1.02	1.44	0.75	0.69	7/8	14	3/4	4.0	8.0
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.07	1.56	0.75	0.78	7/8	16	3/4	4.5	8.0
30	32.00	4.00	33.29	33.44	32.17	36.88	39.12	39.12	1.31	2.00	1.00	0.82	1-1/8	20	1	5.5	8.0
36	38.30	4.00	39.59	39.78	38.47	43.75	46.00	46.00	1.45	2.00	1.00	1.00	1-1/8	24	1	5.5	8.0
42	44.50	4.00	45.79	45.98	44.67	50.62	53.12	53.12	1.45	2.00	1.00	1.25	1-3/8	28	1 1/4	6.0	8.0
48	50.80	4.00	52.09	52.28	50.97	57.50	60.00	60.00	1.45	2.00	1.00	1.35	1-3/8	32	1 1/4	6.0	8.0

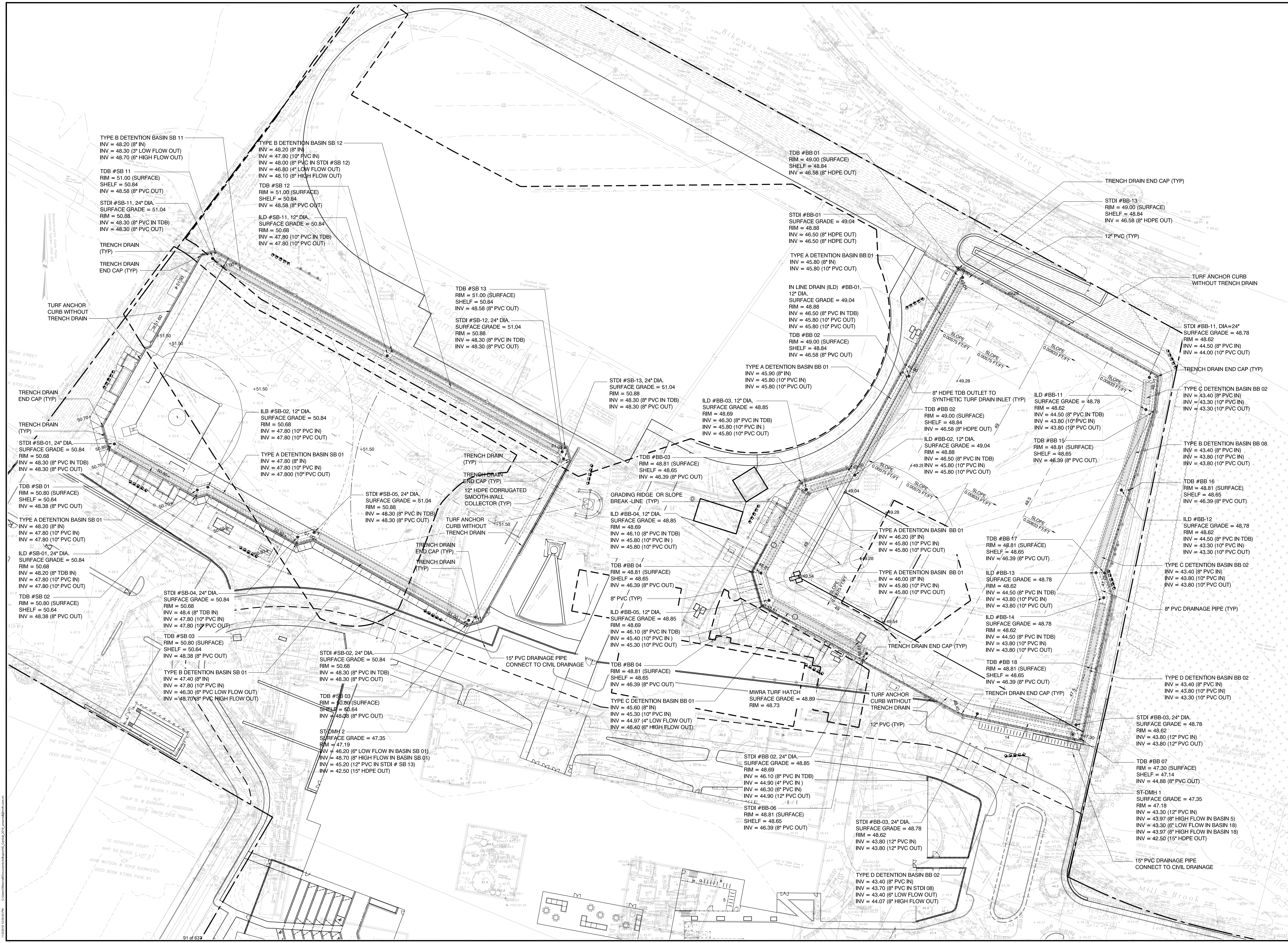
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C153 Mechanical Joint Compact Fittings

90 Degree Bends									
Size	Item No.	Wt.	A	Item No.	Wt.	A	B	T	
3	DWB290	17	3.00	DWB300	18	3.25	8.50	0.30	
3	DWB300	19	3.50	DWB300	18	3.25	8.50	0.33	
4	DWB400	25	4.00	DWB400	22	4.00	9.50	0.34	
4	DWB400	25	4.00	DWB400	22	4.00	9.50	0.34	
6	DWB600	39	5.00	DWB600	41	5.00	11.50	0.36	
6	DWB600	39	5.00	DWB600	41	5.00	11.50	0.36	
8	DWB800	57	6.50	DWB800	58	6.50	12.50	0.38	
10	DWB1000	89	7.50	DWB1000	88	7.50	13.00	0.40	
12	DWB1200	108	8.00	DWB1200	114	8.00	14.50	0.42	
14	DWB1400	210	11.50	DWB1400	211	11.50	16.50	0.47	
16	DWB1600	264	12.50	DWB1600	268	12.50	20.50	0.50	
18	DWB1800	335	14.00	DWB1800	325	14.00	21.00	0.54	
20	DWB2000	400	15.00	DWB2000	390	15.00	22.50	0.57	
24	DWB2400	565	18.75	DWB2400	575	17.00	25.00	0.61	
30	DWB3000	930	21.50	DWB3000	865	21.50	30.50	0.68	
36	DWB3600	1450	24.50	DWB3600	1355	24.50	33.50	0.74	
42	DWB4200	2205	29.25	DWB4200	2055	29.25	38.25	0.82	
48	DWB4800	3290	33.25	DWB4800	2805	33.25	42.25	0.90	

45 Degree Bends									
Size	Item No.	Wt.	A	Item No.	Wt.	A	B	T	
3	DWB245	15	1.50	DWB245	15	1.50	7.00	0.30	
4	DWB445	22	2.00	DWB445	19	2.00	7.50	0.34	
6	DWB645	32	3.00	DWB645	26	3.00	8.50	0.36	
8	DWB845	46	2.50	DWB845	43	3.50	9.00	0.38	
10	DWB1045	70	4.50	DWB1045	70	4.50	10.00	0.40	
12	DWB1245	86	5.00	DWB1245	85	5.00	11.00	0.42	
14	DWB1445	160	6.00	DWB1445	146	5.00	13.00	0.47	
16	DWB1645	202	6.50	DWB1645	212	6.50	13.50	0.50	
18	DWB1845	250	6.00	DWB1845	235	6.00	13.00	0.54	
20	DWB2045	328	7.00	DWB2045	290	7.00	14.00	0.57	
24	DWB2445	455	7.50	DWB2445	380	7.50	14.50	0.61	
30	DWB3045	780	10.50	DWB3045	715	10.50	19.00	0.66	
36	DWB3645	1135	11.50	DWB3645	1040	12.00	21.00	0.72	
42	DWB4245	1610	14.00	DWB4245	1460	14.00	23.00	0.82	
48	DWB4845	2290	15.00	DWB4845	1905	15.00	26.00	0.90	

22-1/2 Degree Bends									
MJ x MJ				MJ x MJ					
Size	Item No.	Wt.	A	Item No.	Wt.	A	B	T	
3	DWB322	15	1.00	DWB322	12	1.00	6.50	0.33	
4	DWB422	18	1.50	DWB422	18	1.00	7.00	0.34	
6	DWB622	31	2.00	DWB622	29	2.00	7.50	0.36	
8	DWB822	46	2.50	DWB822	43	3.00	8.00	0.38	
10	DWB1022	64	3.00	DWB1022	61	3.00	8.50	0.40	
12	DWB1222	80	3.50	DWB1222	79	3.50	9.00	0.42	
14	DWB1422	136	3.75	DWB1422	133	3.75	11.25	0.47	
16	DWB1622	172	3.75	DWB1622	166	3.75	11.75	0.50	
18	DWB1822	235	4.50	DWB1822	225	4.50	12.00	0.54	
20	DWB2022	310	4.50	DWB2022	300	7.00	14.00	0.57	
24	DWB2422	412	4.50	DWB2422	395	7.50	14.50	0.61	
30	DWB3022	685	6.75	DWB3022	600	6.75	16.75	0.66	
36	DWB3622	860	7.75	DWB3622	805	7.75	16.75	0.74	
42	DWB4222	1300	9.00	DWB4222	1200	9.00	18.00	0.82	
48	DWB4822	1760	10.00	DWB4822	1575	10.00	19.00	0.90	



HM
FH

HMFH ARCHITECTS
133 Bishop Allen Drive
Cambridge, MA 02139
617.222.0000
info@hmfh.com

SEAL

JOHN J. AMATO
No. 24799
Professional Engineer
Civil

JJA SPORTS, LLC

BB Chandler/Hill Road
Wrentham, MA 01963
508.333.3347 jja@jja-sports.com

JJA SPORTS

Logo of JJA Sports, LLC featuring a stylized figure running.

CONSERVATION FILING SET
05-07-2020

KEYPLAN

Revisions table with columns: REVISIONS NO., DATE, REMARKS.

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts

Outdoor Athletic Improvements
Grading and Drainage Plan

SCALE: 1"=30'
DRAWN BY: J. AMATO
CHECKED BY: J. AMATO

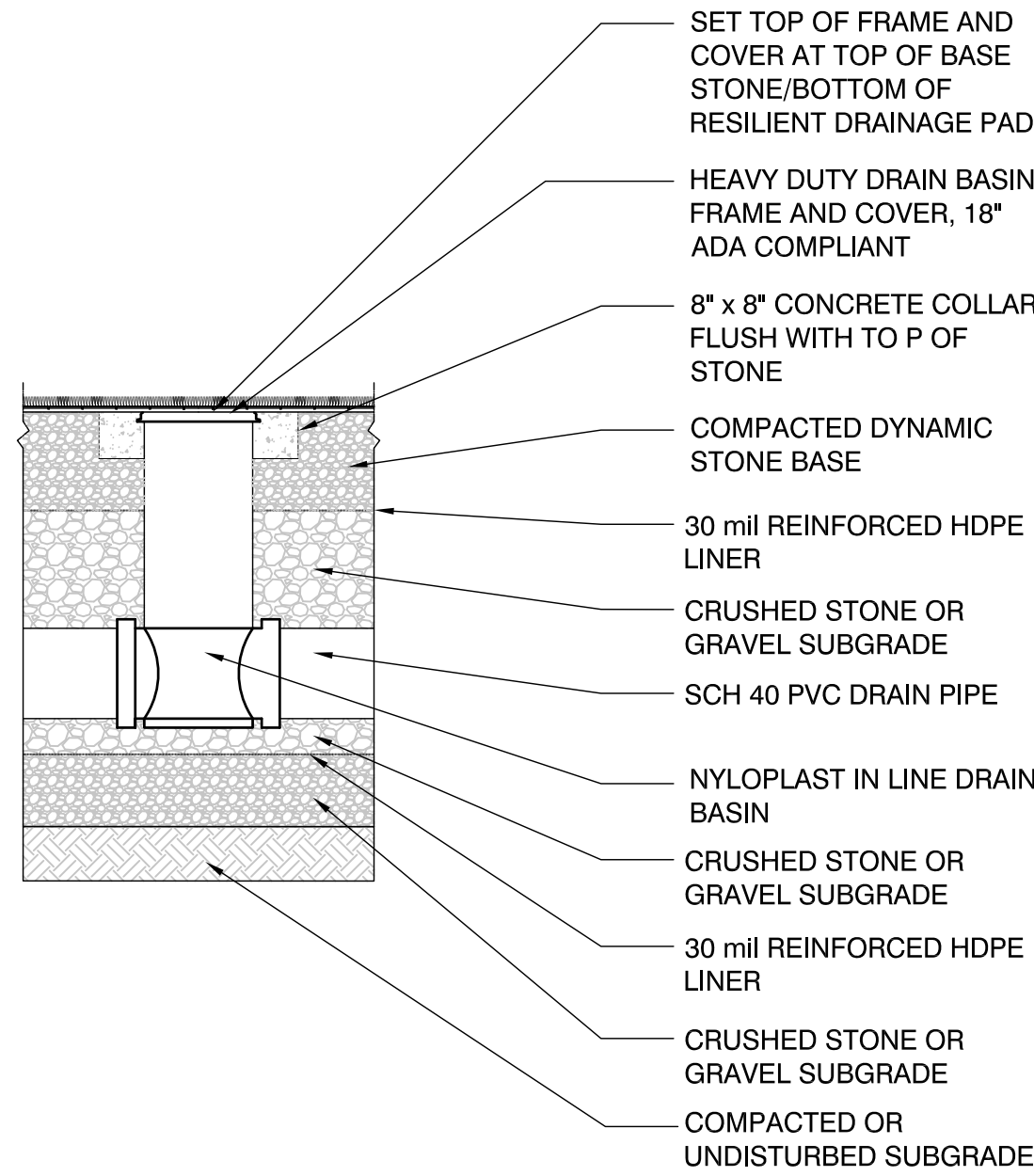
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L8.3

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NOTES:

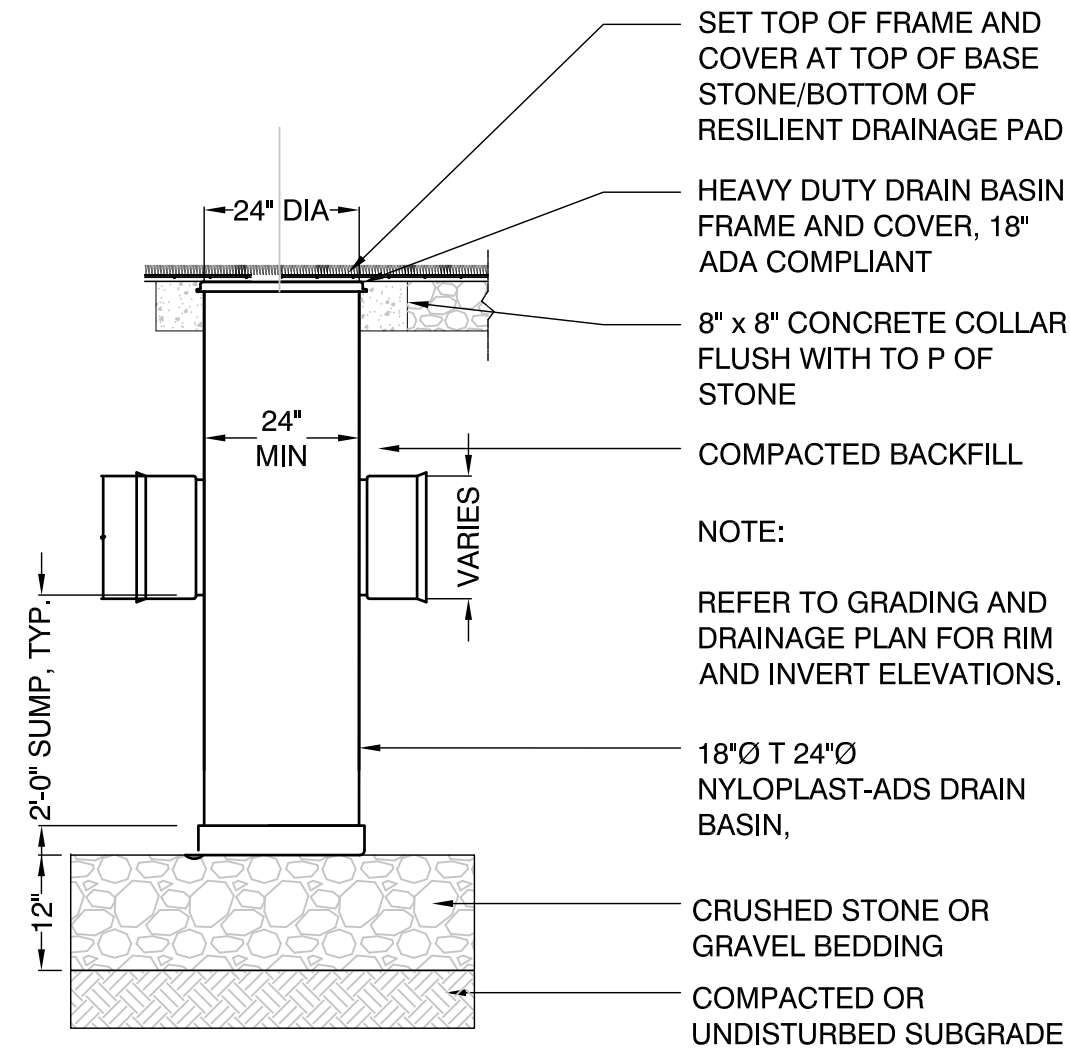
1. IN LINE DRAIN BASINS SHALL BE INSTALLED WITHIN THE SUBSURFACE DETENTION BASIN REACH AND SEALED AT THE TOP PENETRATION USING STAINLESS STEEL LINER CLAMPS.
2. INLET AND OUTLET PIPES ORIGINATE AT THE PERMAVOID BASINS



14 IN LINE DRAIN BASIN (ILD)- AT SYNTHETIC TURF TYP
N.T.S.

NOTES:

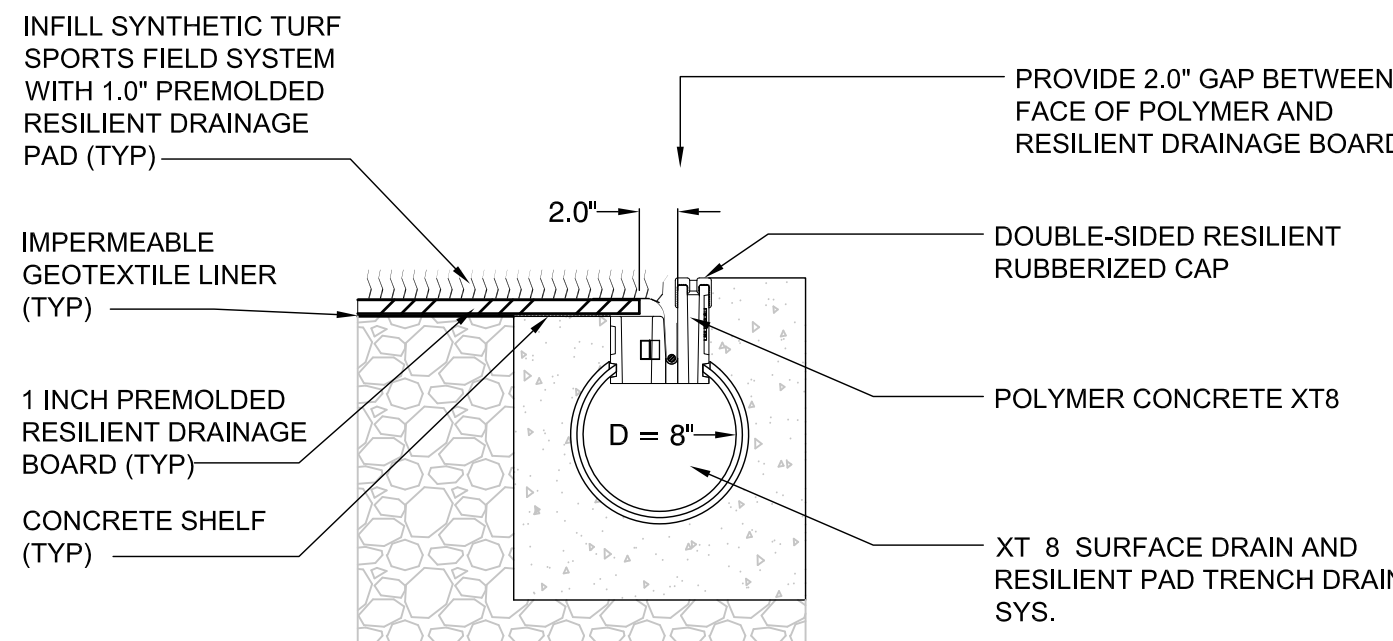
1. SYNTHETIC TURF DRAIN INLETS (SDTI) SHALL BE SIZED BY THE MANUFACTURER BASED ON THE NUMBER AND ORIENTATION OF PIPING. BASINS SHALL BE 2 TIMES THE LARGEST PIPE DIAMETER ENTERING EACH BASIN.
2. WHERE PLACEMENT OF PIPING CREATES ALIGNMENT AND SEPARATION CONCERNS SMALLER DIAMETER PIPING CAN ENTER EACH BASIN USING A 45 DEGREE ELBOW.



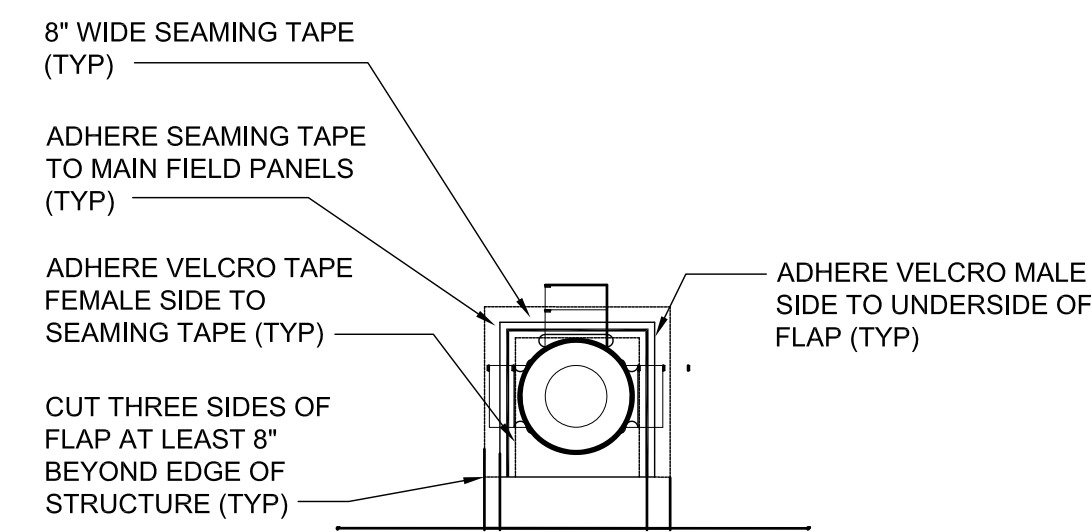
13 SYNTHETIC TURF DRAIN INLET BASIN (SDTI)- AT SYN. TURF TYP
N.T.S.

NOTES:

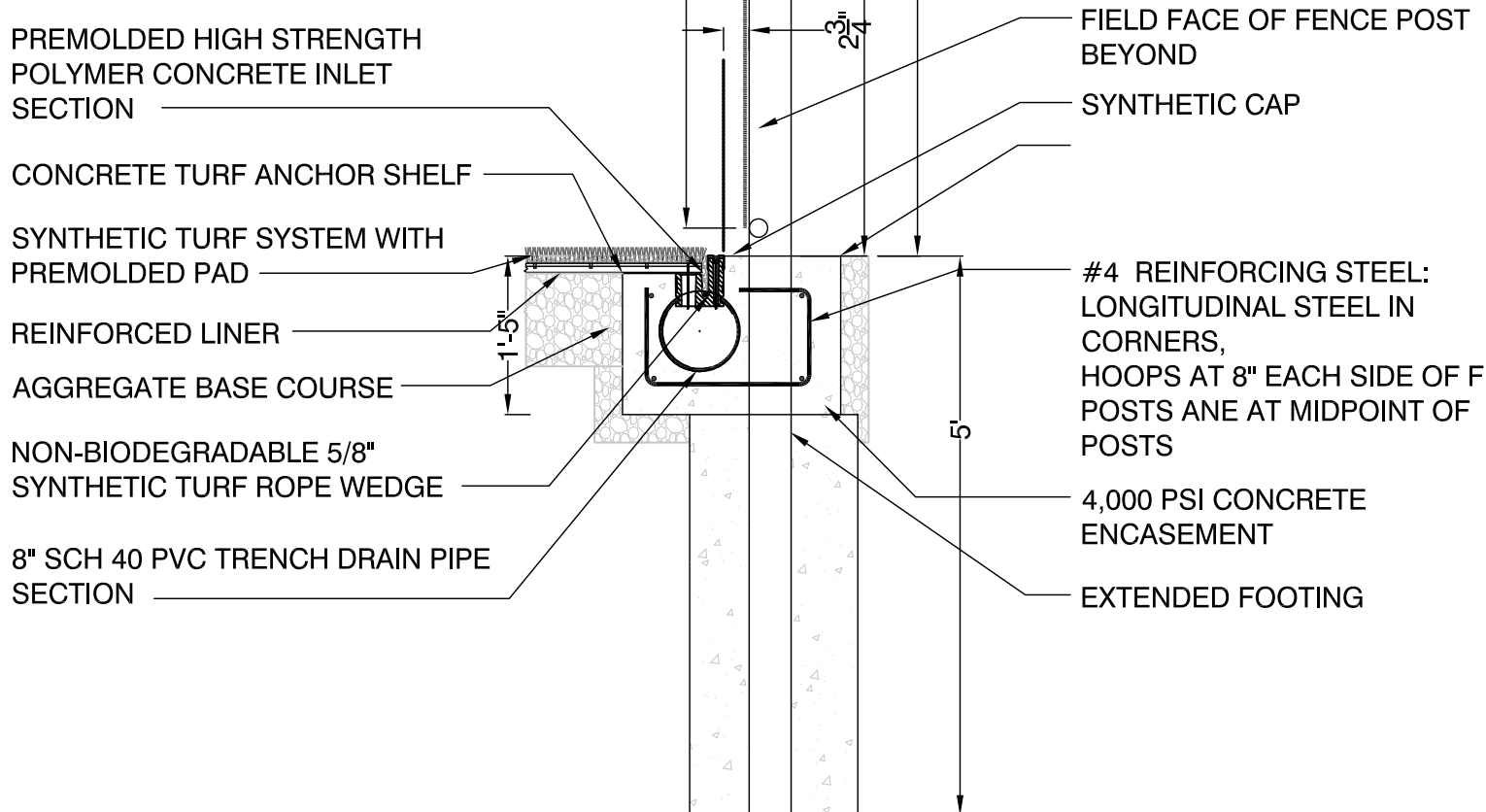
1. REPLACES DUAL TRENCH DRAIN IN A SINGLE UNIT, SEE DETAIL 8 BELOW.
2. SEE CHAIN LINK FENCE POST - SYNTHETIC TURF ANCHOR SECTION FOR INSTALLATION CONDITION AND REINFORCING..



12 INTEGRAL SURFACE/RESILIENT PAD TRENCH DRAIN (TYP)
N.T.S.



11 TRENCH DRAIN BASIN AT INTEGRAL SURFACE/RESILIENT PAD TRENCH DRAIN
N.T.S.



10 CHAIN LINK FENCE POST 12'-3" HEIGHT - SYNTHETIC TURF ANCHOR SECTION
N.T.S.

9 DUAL TRENCH DRAIN BASIN AT SYNTHETIC TURF - SECTION
N.T.S.

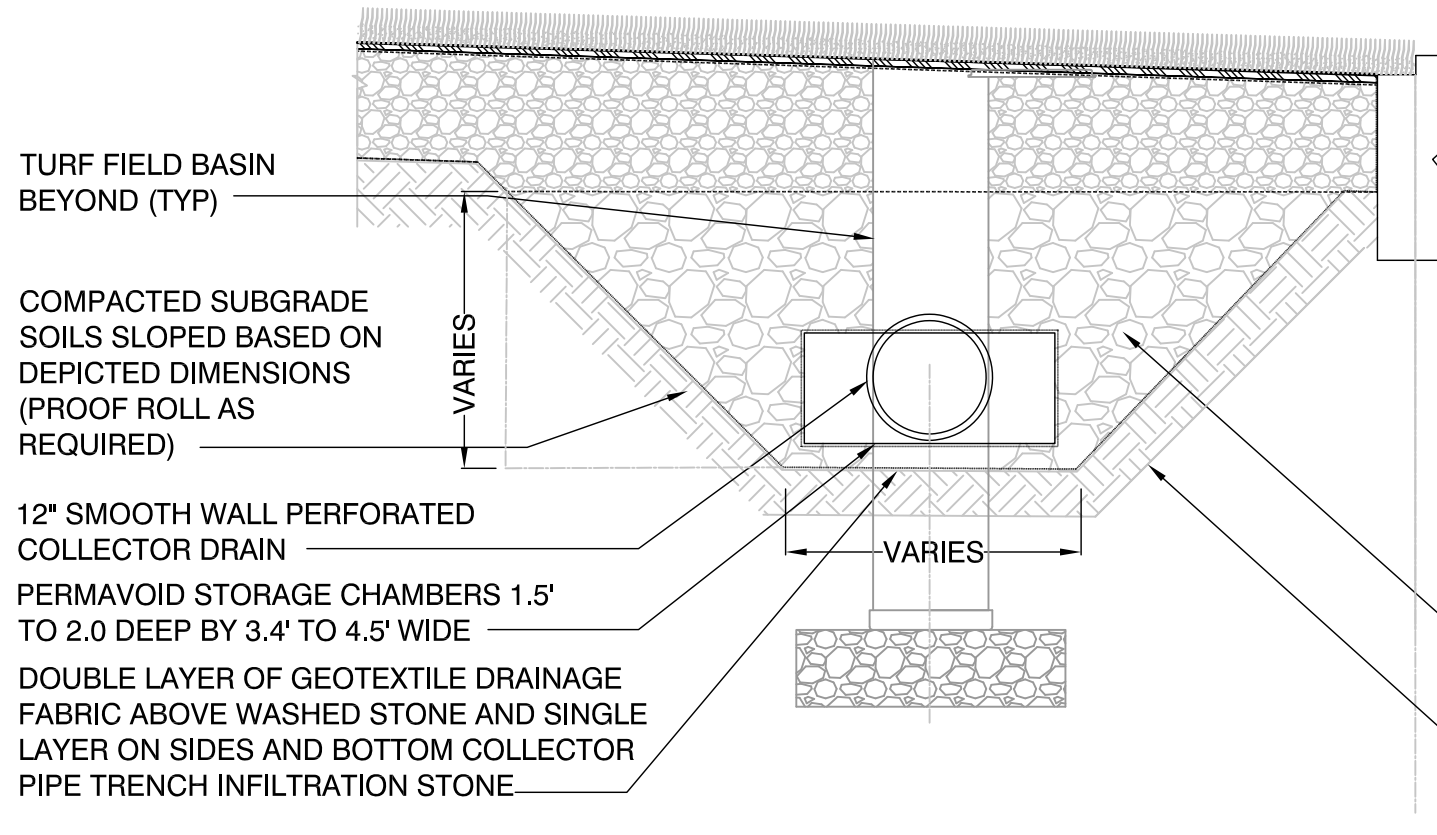
NOTES:

1. CROSS-SECTION ASSUMES THAT THE DYNAMIC STONE TOTAL THICKNESS IS 10". REINFORCED HDPE LINER AND PREMOLDED RESILIENT DRAINAGE PAD IS 1.0". AND THE SETTLED INFILL DEPTH IS 1.50" INCH FOR A TOTAL OF 12.50" IN SECTION THICKNESS.
2. SEE GRADING AND DRAINAGE PLAN FOR TOP OF SURFACE ELEVATIONS.
3. SEE SUBSURFACE DETENTION BASIN DETAILS FOR OVER ALL DIMENSIONS.
4. EACH PERMAVOID STORAGE CHAMBERS UNIT MEASURES 17.9" LONG x 19.9" WIDE x 5.9" HIGH AND ARE ASSEMBLED IN THE FOLLOWING CONFIGURATIONS:

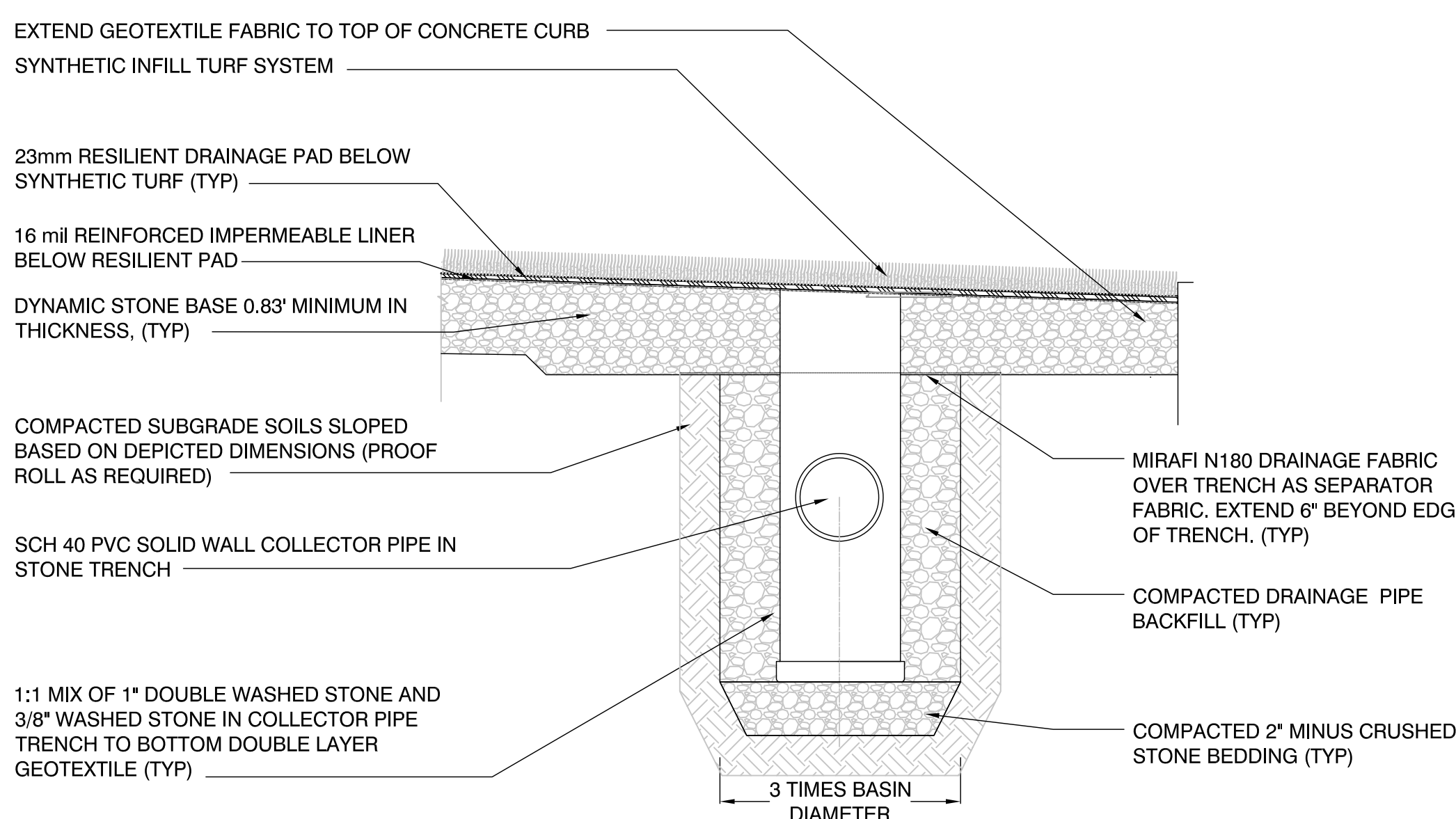
TYPE A: 3 UNIT WIDE BY 2 UNIT HIGH
TYPE B: 4 UNIT WIDE BY 3 UNIT HIGH
TYPE C: 4 UNIT WIDE BY 4 UNIT HIGH

THEY SHALL BE WRAPPED WITH MIRAFI N180 DRAINAGE FABRIC, BEDDED AND BACKFILLED WITH STONE AND SURROUNDED WITH A 30mil IMPERMEABLE LINER/MEMBRANE.

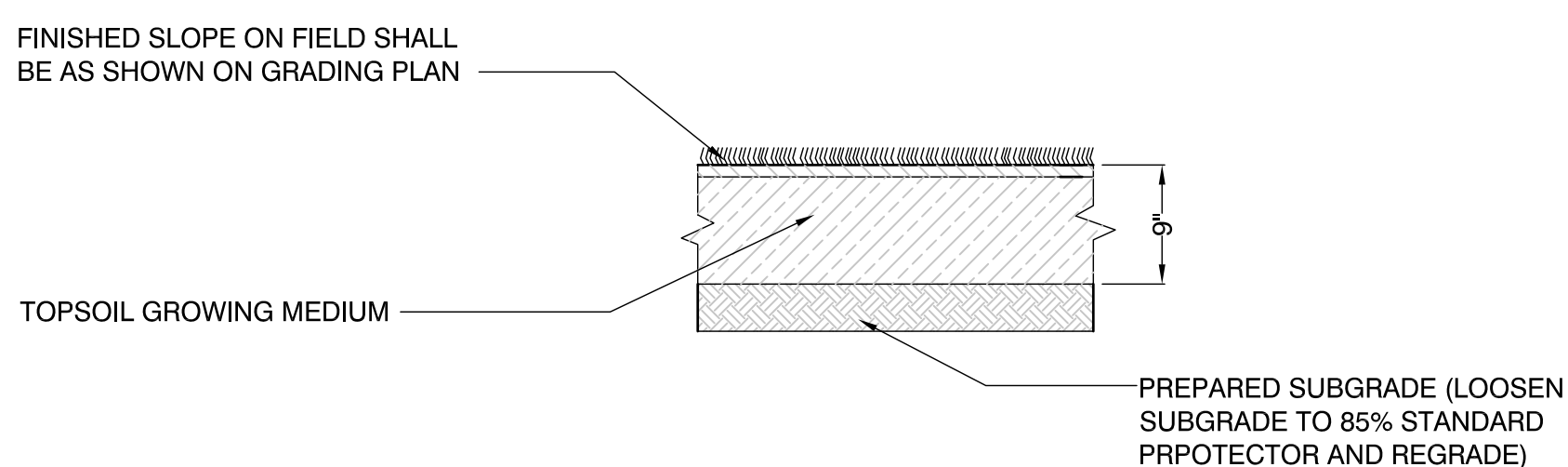
1:1 MIX OF 2" DOUBLE WASHED STONE AND 1" WASHED STONE IN SUBSURFACE DETENTION BASIN TRENCH (TYP)
30 mil IMPERMEABLE LINER/MEMBRANE (TYP)



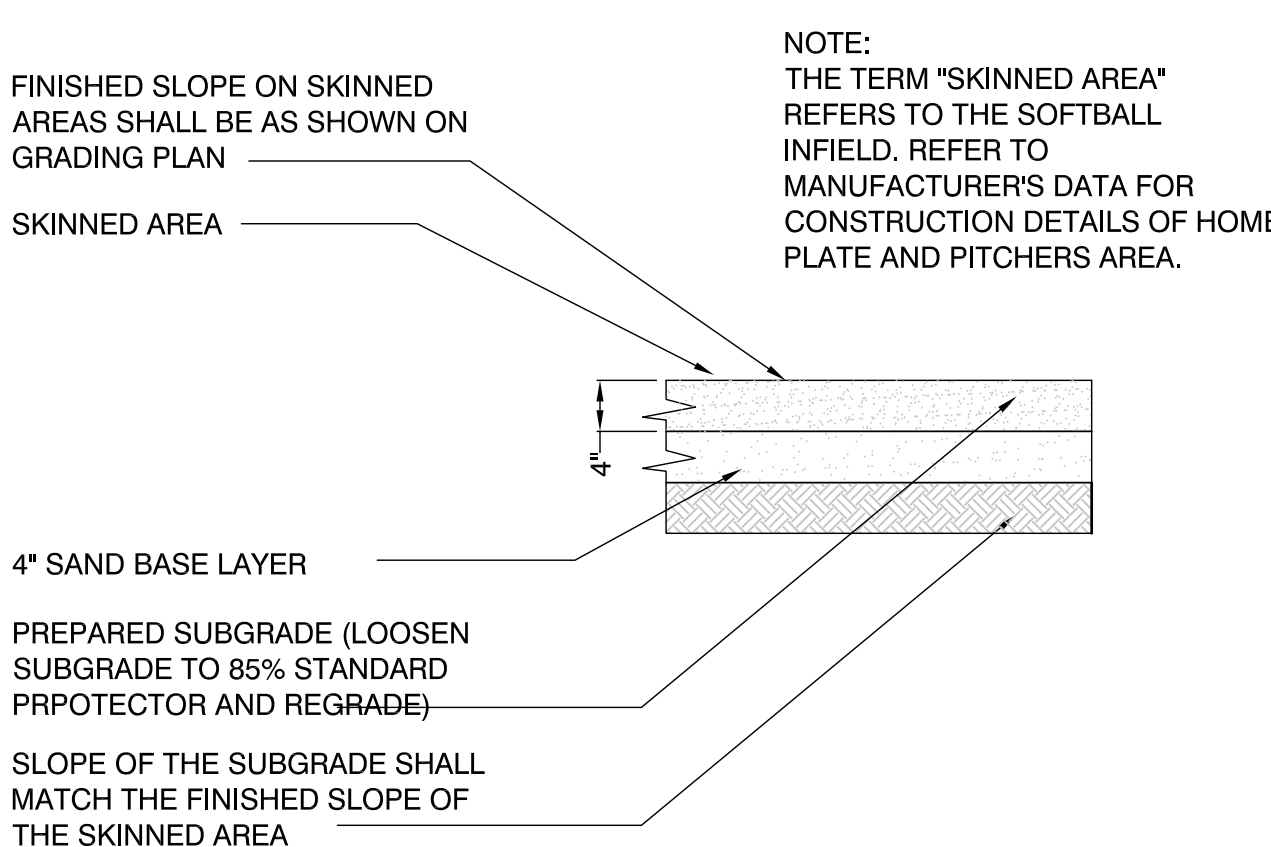
7 SYNTHETIC TURF FIELD LEACHING TRENCH SECTION
N.T.S.



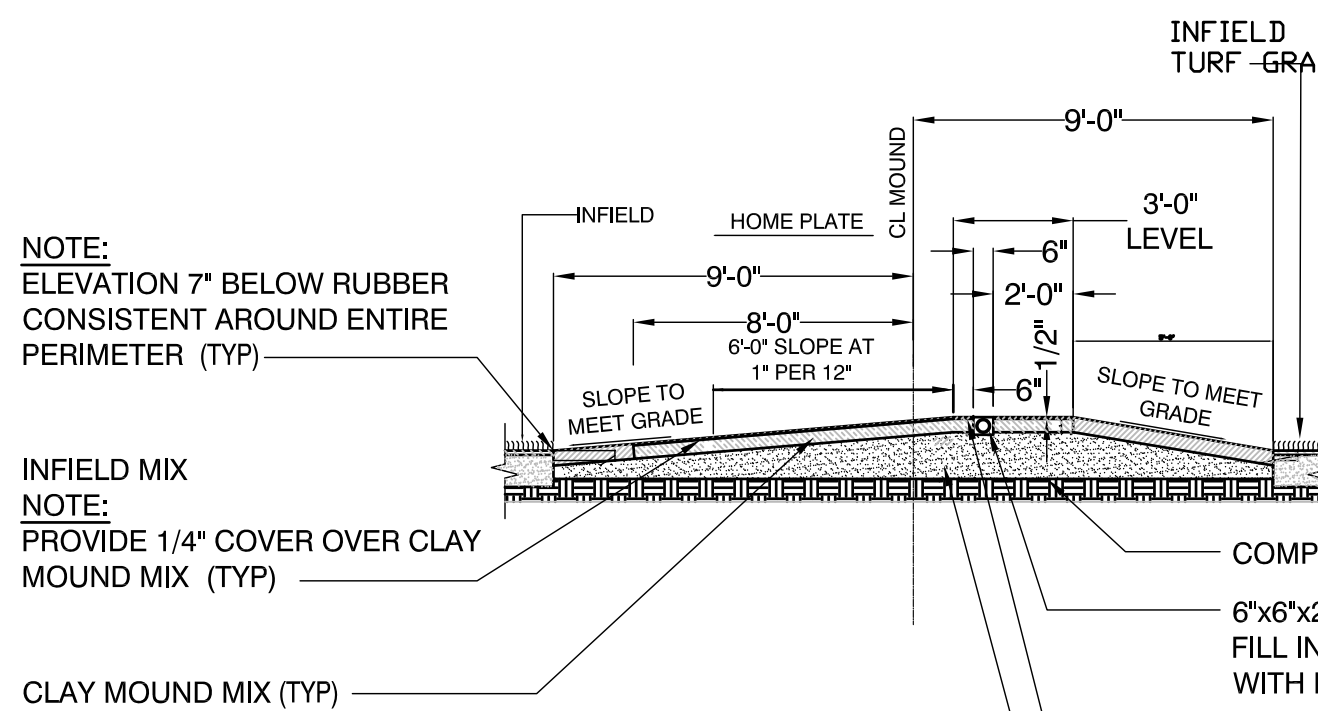
6 COLLECTOR PIPE TRENCH SECTION AT POLYMER DRAIN BASIN(TYP)
N.T.S.



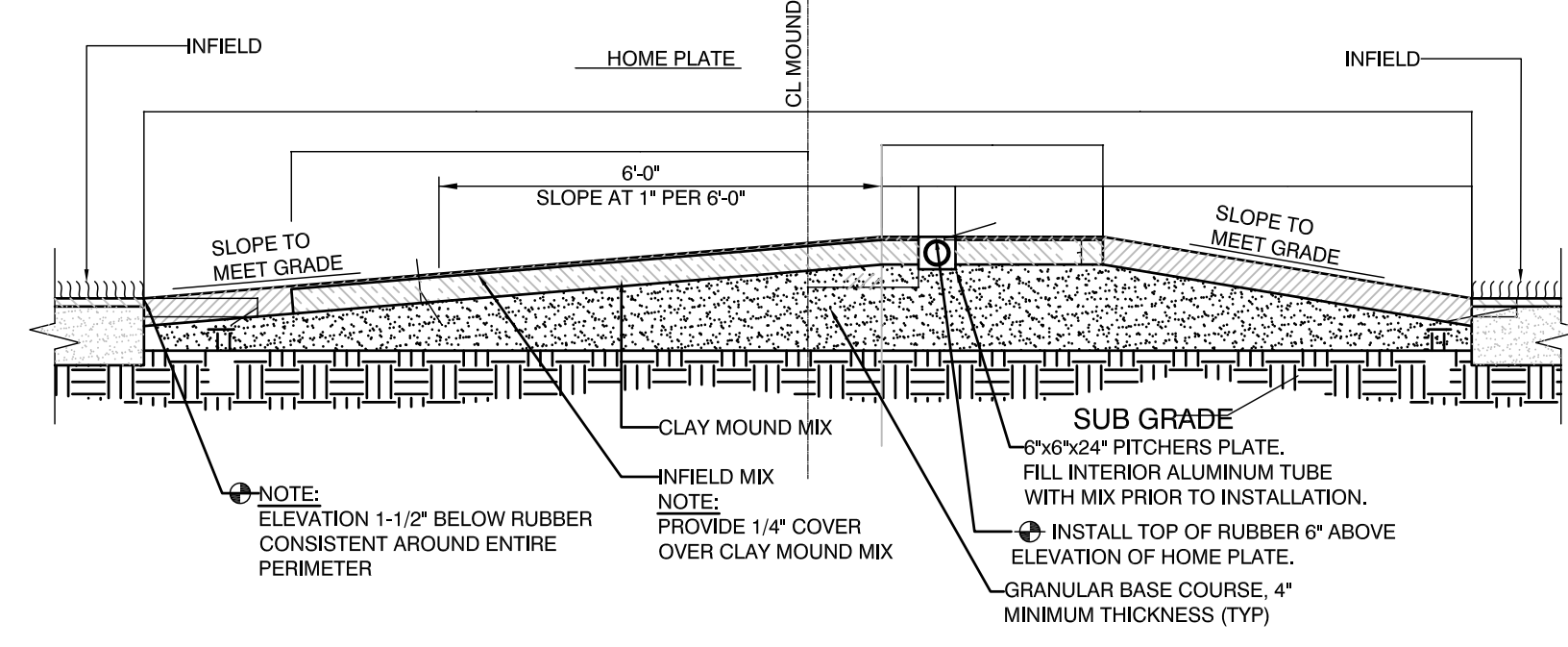
4 BLENDED SOIL/SAND BASED GROWING MEDIUM AT BULL PEN
N.T.S.



3 SKINNED AREA SECTION AT BULL PEN
N.T.S.



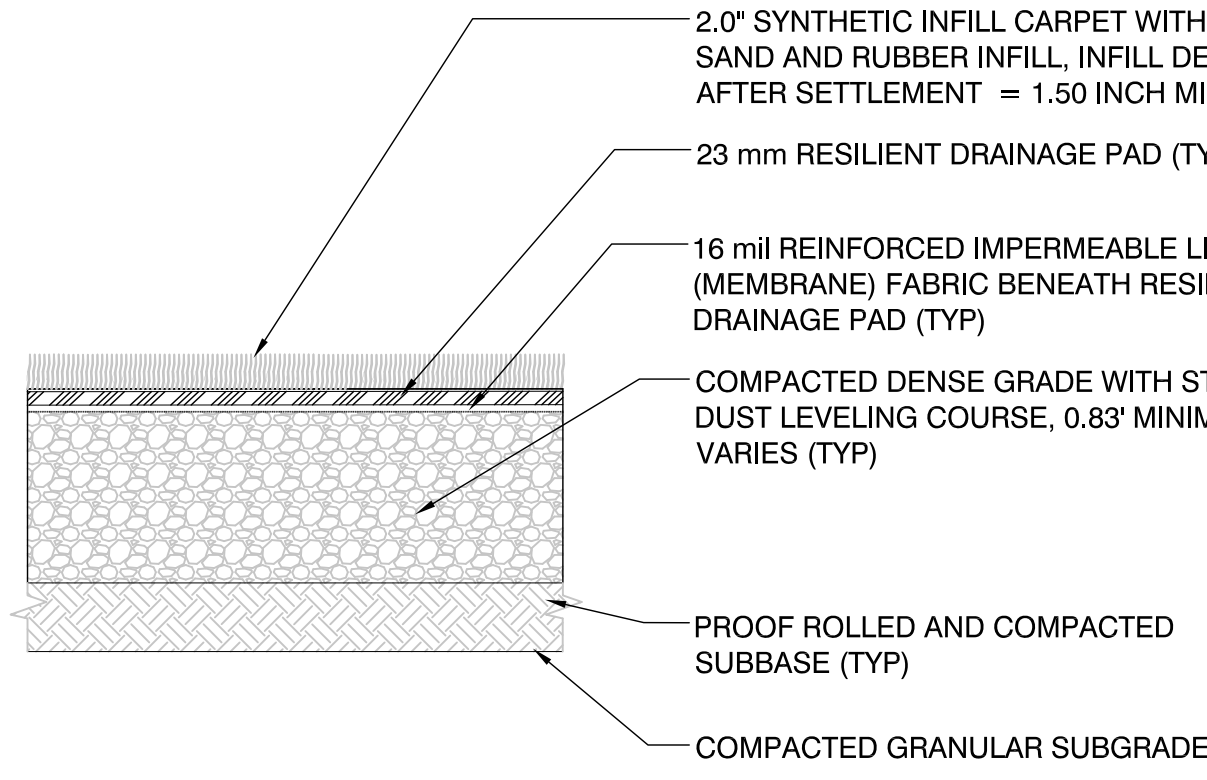
2 BASEBALL NATURAL TURF GRASS MOUND AT BULLPEN - SECTION
NOT TO SCALE



1 SOFTBALL NATURAL TURF GRASS MOUND AT BULLPEN- SECTION
NOT TO SCALE

NOTES:

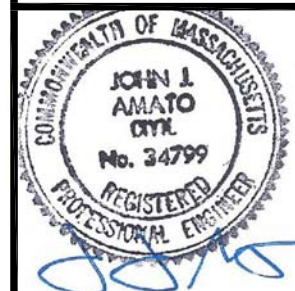
1. INSTALL RESILIENT DRAINAGE PAD IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS (TYP)
2. CONFIRM FINAL GRADE COMPLIANCE BASED ON FIELD ASBUILT AND STRING LINES AS REQUIRED IN TECHNICAL SPECIFICATIONS.
3. COMPACT DENSE GRADE AND TOPPING STONE BASE USING STATIC ROLLING PROCESS. THE USE OF VIBRATION MUST BE APPROVED BY THE ENGINEER. THICKNESS OF DYNAMIC STONE 0.83" MINIMUM (VARIES) TOTAL, CONSISTING OF 0.75" TO 0.77" OF BASE STONE AND 0.04" TO 0.06" OF TOPPING STONE, FOR A TOTAL OF 0.83" (TYP)
4. 16 mil GEOTEXTILE IMPERMEABLE LINER (MEMBRANE) TO BE INSTALLED BENEATH PAD FOR FULL EXTENT OF PAD. LINER TO EXTEND ONTO AND BE SEALED TO ANCHOR CURB SYSTEM.
5. DENSE GRADE STONE BASE ELEVATIONS SHALL MEET A TOLERANCE OF + OR - 0.02 FEET FROM DESIGN GRADES BASED ON A 20 FOOT ASBUILT SURVEY.



8 DUAL TRENCH DRAIN AT SYNTHETIC TURF SPORTS FIELD, TYP.
N.T.S.

H M
F H

HMFH ARCHITECTS



JUA SPORTS, LLC
133 Bishop Allen Drive
Cambridge, MA 02139
617.722.2000
19781 1932-23247 JUA@HMFH.COM
HMFH@hmfh.com



CONSERVATION FILING SET
05-07-2020

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
Outdoor Athletic Improvements
Details
SCALE: NTS
DRAWN BY: J. AMATO CHECKED BY: J. AMATO

REVISIONS NO. DATE REMARKS BY: J. AMATO
L8.7
JOB NUMBER 403417





JJA SPORTS, LLC
 183 CHAMBERLAIN ROAD
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F	H



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DRAWING NUMBER

L8.9

JOB
NUMBER 408417

ARLINGTON HIGH SCHOOL
869 MASSACHUSETTS AVENUE
Arlington, MA 02476



STORMWATER REPORT

Submitted to:

Town of Arlington Conservation Commission,
Massachusetts Department of Environmental Protection

Applicant:

Town of Arlington
730 Massachusetts Avenue
Arlington, MA 02476

Architect:

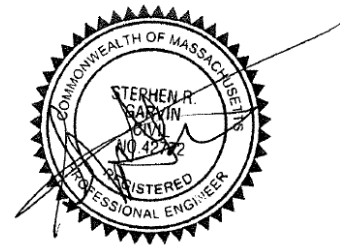
HMFH Architects, Inc.
130 Bishop Allen Dr.
Cambridge, MA 02139

Landscape Architect:

Crosby / Schlessinger / Smallridge LLC
67 Batterymarch St., 2nd Floor
Boston, MA 02110

Civil Engineer/Land Surveyor:

Samiotes Consultants, Inc.
20 A Street
Framingham, MA 01701



07 May 2020

ARLINGTON HIGH SCHOOL STORMWATER MANAGEMENT NARRATIVE ARLINGTON, MA

Introduction:

The existing site, located at 869 Massachusetts Avenue, Arlington, MA, consists of the Arlington High School campus, containing the existing Arlington High School Building with an associated paved driveways, landscaped areas, and utilities as well as grass athletic fields, a turf football field, and facilities. There are several accessory structures across the property for equipment storage and bathroom facilities for the fields. The property is abutted by the Minuteman Commuter Bikeway on the north side, a condominium complex, church, and pharmacy on the east side, and a series of residences and the Francis N. O'Hara building on the west side. The site slopes approximately 35 feet from south to north, with the high point of the site being at Massachusetts Ave. and the low point being on the east side of the site at the end of the Mill Brook culvert. Mill Brook flows through the site from west to east between the existing building and the football stadium via a subsurface concrete box culvert. which splits into two corrugated metal culverts on the east side of the existing building before daylighting on the east side of the site adjacent to Mill Street Extension.

The proposed project includes a new 143,025 square foot High School building footprint with associated new paved parking areas, landscaping, athletic fields, bathroom building, utilities and a new stormwater management system in accordance with the Massachusetts DEP Stormwater Standards. The existing football stadium will remain as is and is not within the scope of this project.

Existing Site Hydrology:

In the existing condition, site drainage is handled by a series of "daisy-chained" catch basins that capture stormwater flows and conveys it via underground stormwater piping to the Mill Brook culvert. There is also a large existing culvert, consisting of a 36" reinforced concrete pipe (RCP), that flows under the existing building and discharges to the Mill Brook culvert. This 36" culvert carries a large upgradient offsite watershed from South of the project site that measures over 4,500,000 sf (105+ Ac). See figure within the appendices of this report. Historically this culvert has been shown to be undersized and has caused flooding and floor buckling within the basement of the High School.

From a stormwater treatment perspective, there is an existing oil/water separator unit on the north side of the building, however this structure only treats a single catchment area of a much larger impervious area on-site. The field areas and football stadium have underdrainage system that ties into the Mill Brook culvert as well.

According to FEMA flood mapping, the site is located within Zones X and AE (see FEMA Firmette Map within the appendices of this report). These flood zones are depicted graphically on the civil design plans and existing conditions plans per the FEMA delineation. However, after a field survey of elevations present at the site, we have concluded that the flood elevations shown on the FEMA mapping are held within the banks of the Mill Brook and do not encroach on the site. During the last major renovation at the school, there was a small area on the east side of the school dedicated for compensatory storage.

Methodology/ Procedure

The proposed Stormwater Management system will include several stormwater Best Management Practices (BMPs) consisting of deep sump catch basins, water quality treatment units, an underground

infiltration system, and three (3) lined rain gardens used for filtration. See the Proposed Watersheds section within this report for detailed information about the proposed BMPs for each watershed included in the stormwater management design.

Watershed Routing

Below is a summary of the various existing and proposed watersheds with a brief narrative describing the routing. The watersheds are depicted in sketches Ex-HYD and P-HYD located in the appendices of this report. The hydrology maps show a single point of analysis (POA) in both the existing conditions and the proposed conditions. POA-1 represents the culmination point of stormwater flows across the site within Mill Brook on the east side of the site.

Existing Watersheds:

Ex- Watershed-1: This watershed consists of the existing high school building, fields, paved parking areas and landscaped areas across the site. Stormwater from this watershed sheet flows overland to existing catch basins across the site, which are conveyed via existing underground piping to the existing drainage systems on the north side of the site before discharging to Mill Brook, defined as POA-1.

Proposed Watersheds:

P- Watershed-1: This watershed consists of paved parking areas, pedestrian walkways, and landscaped areas that sheet flow overland to the proposed deep sump catch basins, where it is then conveyed to a proposed water quality unit prior to discharging to the culvertized portion of Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1).

P- Watershed-1A: This watershed consists of a portion of the paved parking area and landscaped area on the east side of the site. Stormwater sheet flows overland to proposed deep sump catch basins, where it is then conveyed to a proposed water quality unit prior to discharging to Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1).

P- Watershed-1B: This watershed consists of the northwest portion of the proposed building. Stormwater is collected and piped underground via roof drain piping to the culvertized portion of Mill Brook, defined as Point of Analysis 1 (POA-1).

P- Watershed-1C: This watershed consists of pedestrian walkways, landscaped areas, and wooded areas on the east edge of the site. Stormwater sheet flows that do not discharge directly to Mill Brook flow overland to the abutting property where they eventually culminate at Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1).

P- Watershed-1D: This watershed consists of the southern portion of the proposed building. Stormwater is collected and piped underground via roof drain piping to an existing drain pipe that discharges to Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1).

P- Watershed-1E: This watershed consists of pedestrian walkways and landscaped areas that sheet flow overland to the proposed area drains, where it is then conveyed to the culvertized portion of Mill Brook on the east side of the site via underground piping, defined as Point of Analysis 1 (POA-1).

P- Watershed-2: This watershed consists of stormwater flows from the parking area, play area, and landscaped area on the east side of the site. Stormwater flows overland to proposed deep sump catch basins and is conveyed via underground pipe to a proposed underground infiltration system (UGS-1). In larger storm events, flows will discharge via an outlet control structure (OCS-1) and underground piping to an existing drain pipe that discharges to Mill Brook, defined as POA-1.

P- Watershed-2B: This watershed consists of the eastern portion of the proposed building. Stormwater is collected and piped underground via roof drain piping to a proposed underground infiltration system (UGS-1). In larger storm events, flows will discharge via an outlet control structure (OCS-1) and underground piping to an existing drain pipe that discharges to Mill Brook, defined as POA-1.

P- Watershed-3A: This watershed consists of paved parking areas, the Shouler Court paved roadway, pedestrian walkways, amphitheater area, and landscaped areas on the west side of the site that sheet flow overland to proposed deep sump catch basins. Stormwater flows are conveyed via underground piping to a proposed lined Rain Garden (RG-1). Stormwater passes through the soil media and the lined bioretention area channels the filtered stormwater through a perforated underdrain pipe at the bottom of the bioretention system that discharges to another proposed Rain Garden (RG-2), which also has an underdrain pipe collecting flow and discharging to the third Rain Garden (RG-3). This bioretention area has an underdrain and outlet control structure (OCS-2) discharging to the stormwater trunk line running along the north side of the proposed building. Flows from this trunk line are discharged to the culvertized portion of Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1). Note that the proposed Rain Garden (RG-1) has an emergency spillway weir for larger storm events, which discharges to RG-2.

P- Watershed-3B: This watershed consists of paved parking areas and landscaped areas, as well as flows from the upstream RG-1 (see P-Watershed-3A description) on the west side of the site that sheet flow overland to proposed deep sump catch basins. Stormwater flows are conveyed via underground piping to a proposed lined Rain Garden (RG-2). Stormwater passes through the soil media and the lined rain garden channels the filtered stormwater through a perforated underdrain pipe at the bottom of the rain garden that discharges to another proposed Rain Garden (RG-3), which also has an underdrain pipe and outlet control structure (OCS-2) discharging to the stormwater trunk line running along the north side of the proposed building. Flows from this trunk line are discharged to the culvertized portion of Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1). Note that the proposed Rain Garden (RG-2) has an emergency spillway weir for larger storm events, which discharges to RG-3.

P- Watershed-3C: This watershed consists of landscaped areas, as well as flows from the upstream RG-2 (see P-Watershed-3B description) on the west side of the site that sheet flow overland to proposed deep sump catch basins. Stormwater flows are conveyed via underground piping to a proposed lined Rain Garden (RG-3). Stormwater passes through the soil media and the lined rain garden channels the filtered stormwater through a perforated underdrain pipe at the bottom of the rain garden and is collected via an underdrain perforated pipe at the bottom of the rain garden that discharges to the stormwater trunk line running along the north side of the proposed building. Flows from this trunk line are discharged to the culvertized portion of Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1). Note that the proposed Rain Garden (RG-3) has an outlet control structure associated with its design for larger storm events, which discharges to the outlet pipe and trunk line.

P- Watershed-4: This watershed consists of pedestrian walkways and synthetic turf soccer field areas on the west side of the site that are collected via underdrain piping and area drains and passed through a series of small detention basins prior to discharging to the trunk line on the north side of the proposed building and ultimately discharging to the culvertized portion of Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1).

P- Watershed-5: This watershed consists of pedestrian walkways and synthetic turf baseball field areas on the east side of the site that are collected via underdrain piping and area drains and passed through a series of small detention basins prior to discharging to the culvertized portion of Mill Brook on the east side of the site, defined as Point of Analysis 1 (POA-1).

Flood Storage

As discussed previously within this report the site is graphically located within Flood Zones X and AE per FEMA mapping, but the actual elevations per the Flood Impact Study occur within the banks of the Mill Brook. There is a small compensatory storage area on the east side of the existing building that was for a previous project but not defined by elevations or compensatory storage volumes. This area will be disturbed by the proposed High School project. The proposed project even though not within flood plain elevations will emulate the existing compensatory storage by providing compensatory storage within the stone of the turf fields that far exceed the volume held by the existing flood storage area.

Results/ Summary

Analysis:

The analysis was based on the pre and post development peak discharge rates at the point of analysis. The proposed construction of the school campus will result in an increase in impervious area, therefore the proposed stormwater management system will be designed to mitigate any increase in the rate of runoff and improve stormwater quality in accordance with the requirements of the Massachusetts Stormwater Management Policy Standards.

Results of Analysis:

Through the use of the HydroCAD Software, the curve numbers, times of concentrations, and peak discharge rates were determined for both the existing conditions and the proposed conditions. The results of the study shows that both the post-development peak rates of runoff are equal or less than the existing rates.

As shown in Table 1, the post development peak rates of runoff from the site to each POA will be mitigated.

Table 1 – POA-1 : Peak Rates of Runoff				
	2-year storm (cfs)	10-year storm (cfs)	25-year storm (cfs)	100-year storm (cfs)
Existing	21.47	39.53	52.75	76.96
Proposed	20.97	39.44	49.50	69.87

Stormwater Management Standards

The Department of Environmental Protection has implemented the Stormwater Management Standards as of November 18, 1996 and updated them in April 2008. The standards met are described below and in the Stormwater Management Form as provided by DEP.

Standard #1: Untreated Stormwater

The project is designed so that stormwater conveyances (outfalls/discharges) do not discharge untreated stormwater into, or cause erosion to, wetlands or waters.

Therefore Standard #1 is met.

Standard #2: Post-development peak discharge rates

The proposed construction of Arlington High School will result in an overall site increase in impervious area. The proposed stormwater management system has been designed so that there is no increase in post construction discharge rates from the site for each point of analysis by the introduction of stormwater BMPS such as bioretention areas and underground infiltration basins. See Table 1 of this report for existing and proposed flows to the Point of Analysis, showing that Standard #2 is met.

Therefore Standard #2 is met.

Standard #3: Recharge to groundwater

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, stormwater best management practices, and good operation and maintenance procedures. At a minimum, the annual recharge from the post- development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Soil types have been identified based on the information contained in the Soil Report (see Soil Report within appendices of this report). Based on the available soil information provided in the appendices of this report, we have determined that the soils are consistent with Hydrologic soil type "B" which require runoff to be infiltrated (as listed in the table below) from new impervious areas. Test pit data from testing done on site confirms the Soil Report information in the appendices of this report.

Hydrologic Group Volume to Recharge x (Total Impervious Area)	
Hydrologic Group	Volume to Recharge x Total Impervious Area
A	0.60 inches of runoff
B	0.35 inches of runoff
C	0.25 inches of runoff
D	0.10 inches of runoff

"B" Soils

Infiltration Rate: 0.35 inches of runoff
Existing Impervious Area: 7.78 Ac. (338,984 sf)
Proposed Impervious Area: 8.63 Ac. (375,923 sf)
Proposed Site New Impervious Area in "B" Soils: 36,939 sf
 $36,939 \text{ sf} \times 0.35 \times (1/12) = 1,077 \text{ cf}$

Total required recharge volume: 1,077 cf

Proposed Recharge Volume:
Infiltration System UGS-1 = 2,498 cf

Total provided recharge volume: 2,498 cf

Drawdown Time:

UCS-1 (maximum time 72 hours)= $2,523 \text{ cf} / (1.02 \text{ in/hr} \times 1,672 \text{ sf} / 12 \text{ in/ft}) = 17.75 \text{ hours}$

Therefore Standard #3 is met.

Standard #4: TSS removal

The BMP's selected to remove TSS from impervious areas for this include: Deep Sump Catch Basins (CB), Water Quality Units (WQU), three (3) bioretention areas & an Infiltration System (UCS-1). Building roof runoff is considered "clean" and therefore does not require TSS removal.

P-Watershed-1: (Parking, Walkways)
Deep Sump Catch Basin: $(1.00)(1.00-0.25) = 0.75$
Water Quality Unit: $(0.75)(1.00-0.80) = 0.15$
Total TSS Removal= 85%

P-Watershed-1A: (Parking, Walkways)
Deep Sump Catch Basin: $(1.00)(1.00-0.25) = 0.75$
Water Quality Unit: $(0.75)(1.00-0.80) = 0.15$
Total TSS Removal= 85%

P-Watershed-2: (Parking, Walkways)
Deep Sump Catch Basin: $(1.00)(1.00-0.25) = 0.75$
Infiltration Basin: $(0.75)(1.00-0.80) = 0.15$
Total TSS Removal= 85%

P-Watershed-3A: (Parking, Walkways)
Deep Sump Catch Basin: $(1.00)(1.00-0.25) = 0.75$
Bioretention Area: $(0.75)(1.00-0.90) = 0.075$
Bioretention Area: $(0.08)(1.00-0.90) = 0.008$
Bioretention Area: $(0.01)(1.00-0.90) = 0.001$
Total TSS Removal= 99.9%

P-Watershed-3B: (Parking)
Deep Sump Catch Basin: $(1.00)(1.00-0.25) = 0.75$
Bioretention Area: $(0.75)(1.00-0.90) = 0.075$
Bioretention Area: $(0.08)(1.00-0.90) = 0.008$
Total TSS Removal= 99%

Water Quality Volume:

The project qualifies for the 0.5" runoff rate applied to the total impervious area for the water quality volume, as shown in the calculations provided below. The calculations for the infiltration stormwater BMPs are shown below. Where site topography and groundwater elevation precluded the use of infiltration BMPs, proprietary water quality unit are proposed which are specifically designed to address water quality prior to discharge. Roof runoff is considered "clean" and has therefore been excluded from this calculation.

Impervious area requiring water quality treatment= 82,241 sf
 $82,241 \text{ sf} \times .0417 \text{ ft} = 3,429 \text{ CF}$

Total Water Quality Volume Required = 3,429 CF

Proposed Water Quality Volume:

Infiltration System UCS-1 = 2,498 cf

Bioretention System RG-1 = 333 cf

Bioretention System RG-2 = 609 cf

Bioretention System RG-3 = 890 cf

Total provided water quality volume: 4,330 cf

Therefore Standard #4 is met.

Standard #5: Higher potential pollutant loads

The project site does not contain Land Uses with Higher Potential Pollutant Loads, therefore Standard #5 is met.

Standard #6: Protection of critical areas

Critical areas are Outstanding Resource Waters (ORW) as designated in 314 CMR 4.00, Special Resource Waters as designated in 314 CMR 4.00, recharge areas for public water supplies as defined in 310 CMR 22.02 (Zone Is, Zone IIs and Interim Wellhead Protection Areas for groundwater sources and Zone As for surface water sources), bathing beaches as defined in 105 CMR 445.000, cold-water fisheries as defined in 314 CMR 9.02 and 310 CMR 10.04, and shellfish growing areas as defined in 314 CMR 9.02 and 310 CMR 10.04.

The site is not located within critical areas, therefore Standard #6 is met.

Standard #7: Redevelopment projects

While a portion of the site is being redeveloped, there is an increase in impervious area, thus the project is considered New Construction and all of the Standards will be met.

Standard #8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

Soil Erosion and Sediment Control Plan:

The objectives of the Soil Erosion and Sediment Control Plan are to control erosion at its source with temporary control structures, minimize the runoff from areas of disturbance, and de-concentrate and distribute stormwater runoff through natural vegetation before discharge to critical zones such as streams or wetlands. Soil erosion control does not begin with the perimeter sediment trap. It begins at the source of the sediment, the disturbed land areas, and extends down to the control structure.

The Soil Erosion and Sediment Control Plan will be enacted in order to protect the resource areas during construction. The erosion control devices will remain in place until all exposed areas have been stabilized with vegetation or impervious surfaces.

The objective of the Soil Erosion & Sediment Control Plan that will be enacted on site is to control the vulnerability of the soil to the erosion process or the capability of moving water to detach soil particles during the construction phase(s).

The soil erosion and sediment control BMP's for the site are straw wattles with silt fence, catch basin filters, and a construction entrance as shown on design plans prepared by Samiotes Consultants, Inc.

Therefore Standard #8 is met.

Standard #9: Operation/maintenance plan

An operation and maintenance plan for both construction and post-development stormwater controls has been developed. The plan includes owner(s); parties responsible for operation and maintenance; schedule for inspection and maintenance; routine and non-routine maintenance tasks. A copy of the O&M is included in the appendices of this report.

Therefore Standard #9 is met.

Standard #10: All illicit discharges to the stormwater management system are prohibited

It is not anticipated that there will be any Illicit discharges for the project as it will be new construction, therefore Standard #10 is met.

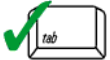
P:\Projects\2017\17211.00 Arlington HS, 869 Mass Ave (Civil)\Documents\Hydrology



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

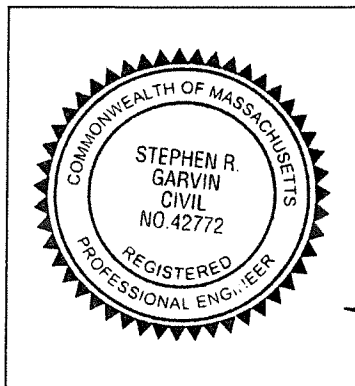
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



[Handwritten Signature]
Signature and Date

5/7/20

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☐ New development
- ☐ Redevelopment
- ☒ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☒ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
- ☒ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☐ Description and delineation of public safety features;
 - ☐ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☐ An Illicit Discharge Compliance Statement is attached;
- ☒ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

APPENDIX 1:
Existing Hydrology Calculations

APPENDIX 2:
Proposed Hydrology Calculations

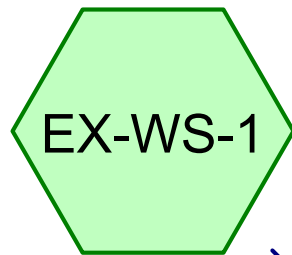
APPENDIX 3:
Test Pit Logs
Soils Report

APPENDIX 4:
Operations and Maintenance Plan

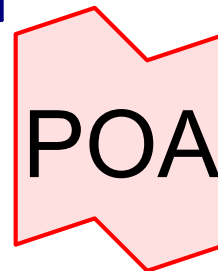
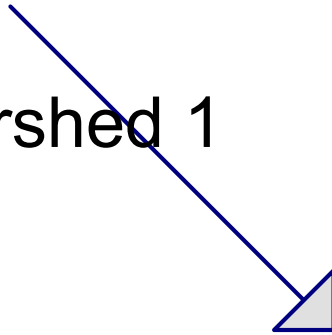
APPENDIX 5:
Calculations

APPENDIX 6:
Sketches

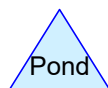
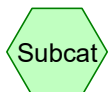
APPENDIX 1:
Existing Hydrology Calculations



Existing Watershed 1



POA



Routing Diagram for 17211.00 Arlington HS - Existing Conditions

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17211.00 Arlington HS - Existing Conditions

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.598	61	>75% Grass cover, Good, HSG B (EX-WS-1)
5.051	98	Impervious (EX-WS-1)
2.731	98	Roofs, HSG B (EX-WS-1)
0.020	55	Woods, Good, HSG B (EX-WS-1)
17.400	78	TOTAL AREA

17211.00 Arlington HS - Existing Conditions

Type III 24-hr 2 yr Rainfall=3.20"

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Page 3

Summary for Subcatchment EX-WS-1: Existing Watershed 1

Runoff = 21.47 cfs @ 12.16 hrs, Volume= 1.846 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
* 5.051	98	Impervious
2.731	98	Roofs, HSG B
9.598	61	>75% Grass cover, Good, HSG B
0.020	55	Woods, Good, HSG B
17.400	78	Weighted Average
9.618		55.28% Pervious Area
7.782		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, 50' SF Grass: Short n= 0.150 P2= 3.20"
1.9	220	0.0140	1.90		Shallow Concentrated Flow, 220' SCF Unpaved Kv= 16.1 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, 140' SCF (paved) Paved Kv= 20.3 fps
0.1	20	0.0100	4.91	3.86	Pipe Channel, 12" Pipe Flow 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.7	500	0.0050	11.67	466.77	Pipe Channel, Box Culvert Flow 96.0" x 60.0" Box Area= 40.0 sf Perim= 26.0' r= 1.54' n= 0.012
11.0	930	Total			

17211.00 Arlington HS - Existing Conditions

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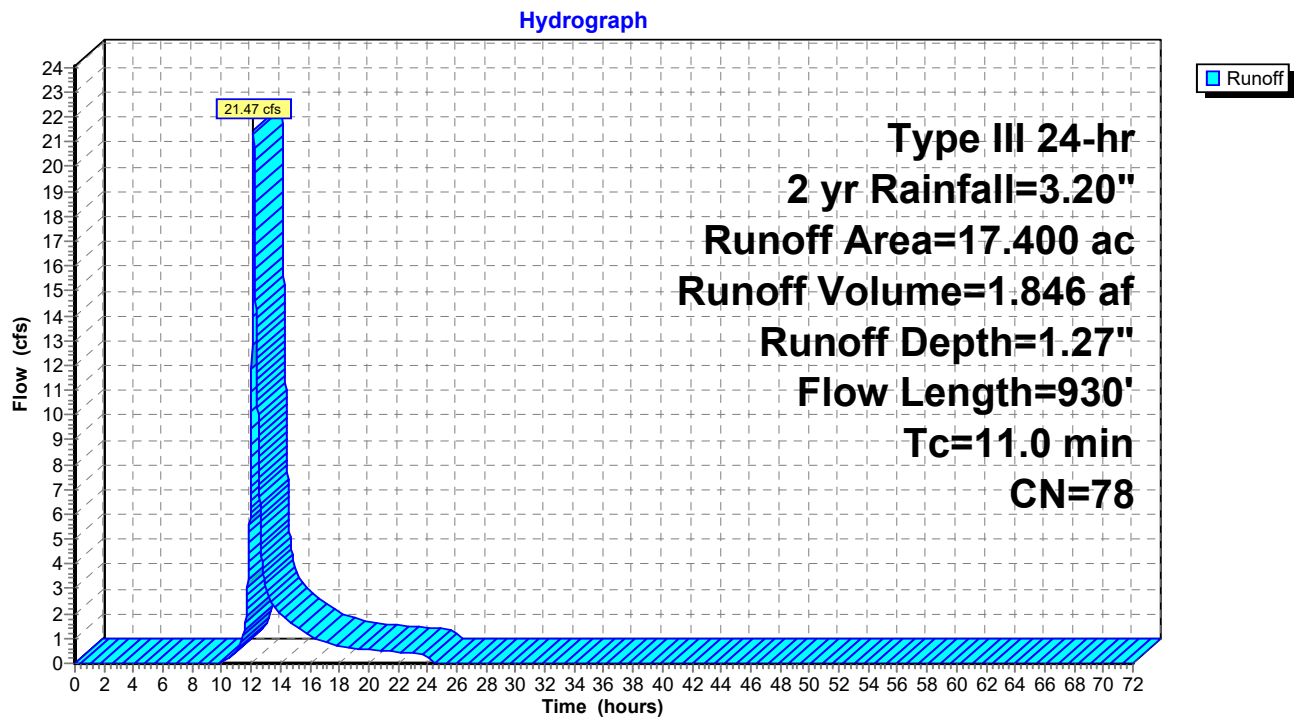
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Type III 24-hr 2 yr Rainfall=3.20"

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Subcatchment EX-WS-1: Existing Watershed 1



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Type III 24-hr 2 yr Rainfall=3.20"

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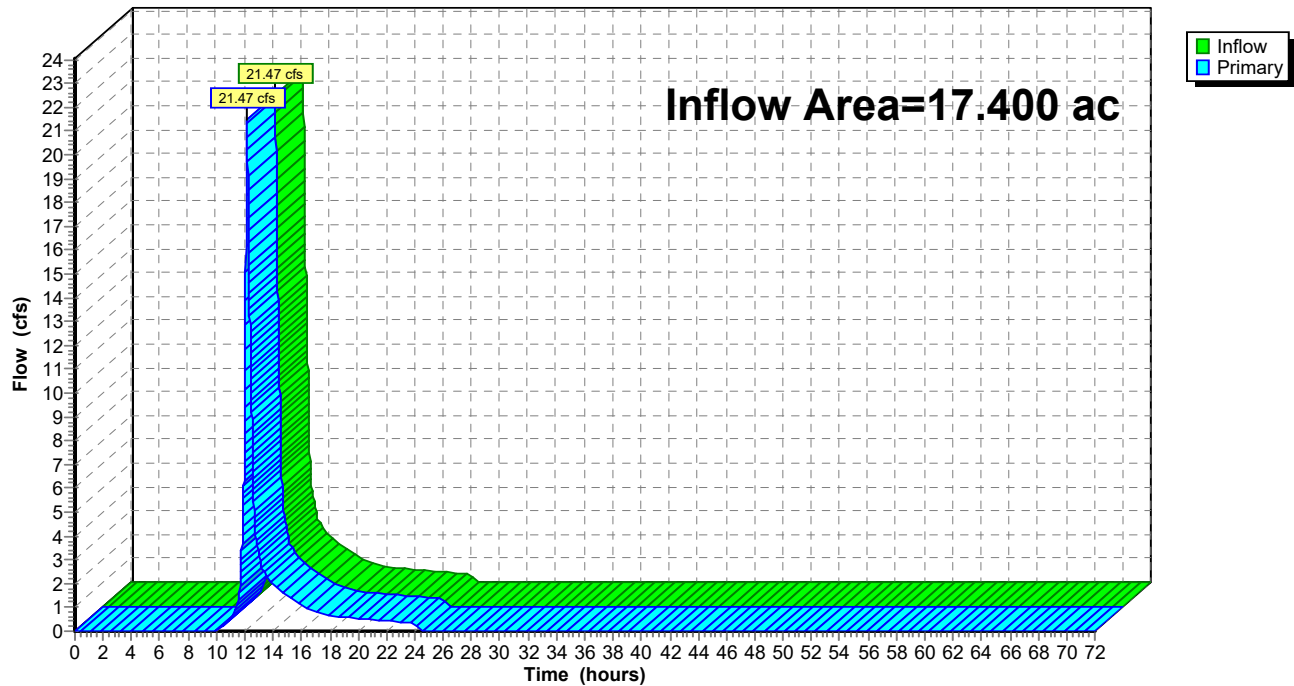
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Inflow Area = 17.400 ac, 44.72% Impervious, Inflow Depth = 1.27" for 2 yr event
Inflow = 21.47 cfs @ 12.16 hrs, Volume= 1.846 af
Primary = 21.47 cfs @ 12.16 hrs, Volume= 1.846 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link POA: POA

Hydrograph



17211.00 Arlington HS - Existing Conditions

Type III 24-hr 10 yr Rainfall=4.50"

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Page 6

Summary for Subcatchment EX-WS-1: Existing Watershed 1

Runoff = 39.53 cfs @ 12.16 hrs, Volume= 3.325 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
* 5.051	98	Impervious
2.731	98	Roofs, HSG B
9.598	61	>75% Grass cover, Good, HSG B
0.020	55	Woods, Good, HSG B
17.400	78	Weighted Average
9.618		55.28% Pervious Area
7.782		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, 50' SF Grass: Short n= 0.150 P2= 3.20"
1.9	220	0.0140	1.90		Shallow Concentrated Flow, 220' SCF Unpaved Kv= 16.1 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, 140' SCF (paved) Paved Kv= 20.3 fps
0.1	20	0.0100	4.91	3.86	Pipe Channel, 12" Pipe Flow 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.7	500	0.0050	11.67	466.77	Pipe Channel, Box Culvert Flow 96.0" x 60.0" Box Area= 40.0 sf Perim= 26.0' r= 1.54' n= 0.012
11.0	930	Total			

17211.00 Arlington HS - Existing Conditions

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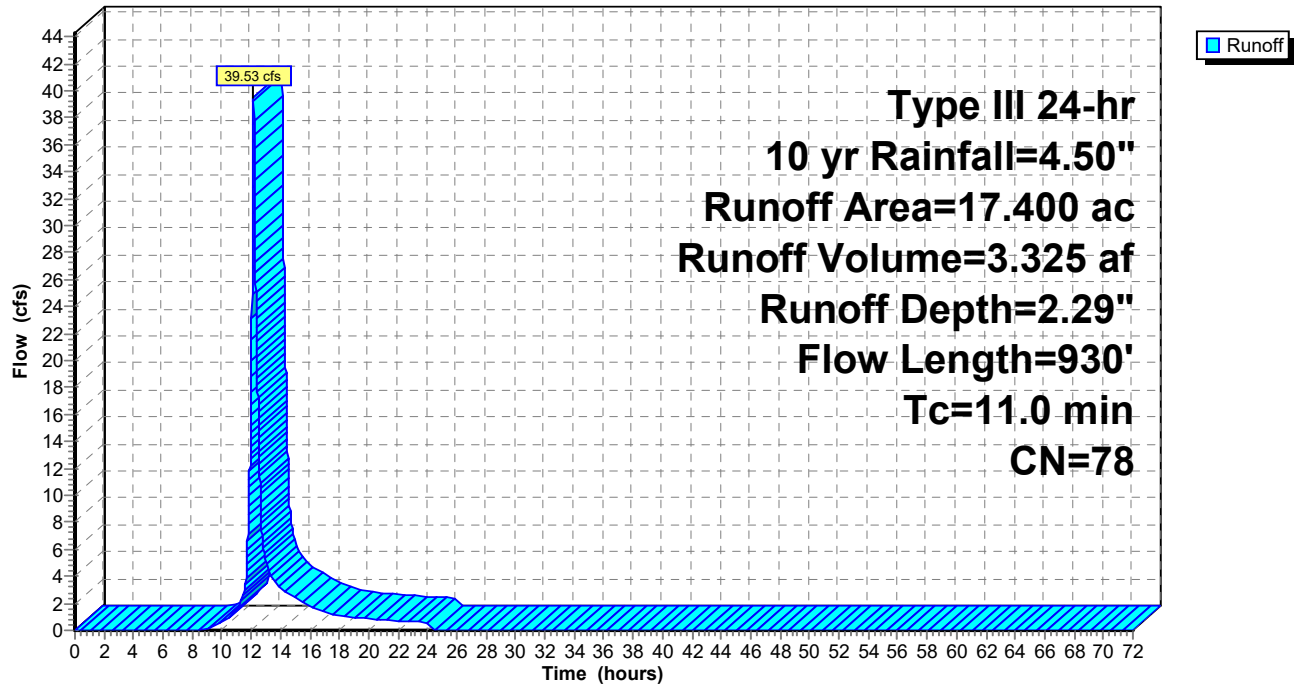
Type III 24-hr 10 yr Rainfall=4.50"

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Subcatchment EX-WS-1: Existing Watershed 1

Hydrograph



17211.00 Arlington HS - Existing Conditions

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Type III 24-hr 10 yr Rainfall=4.50"

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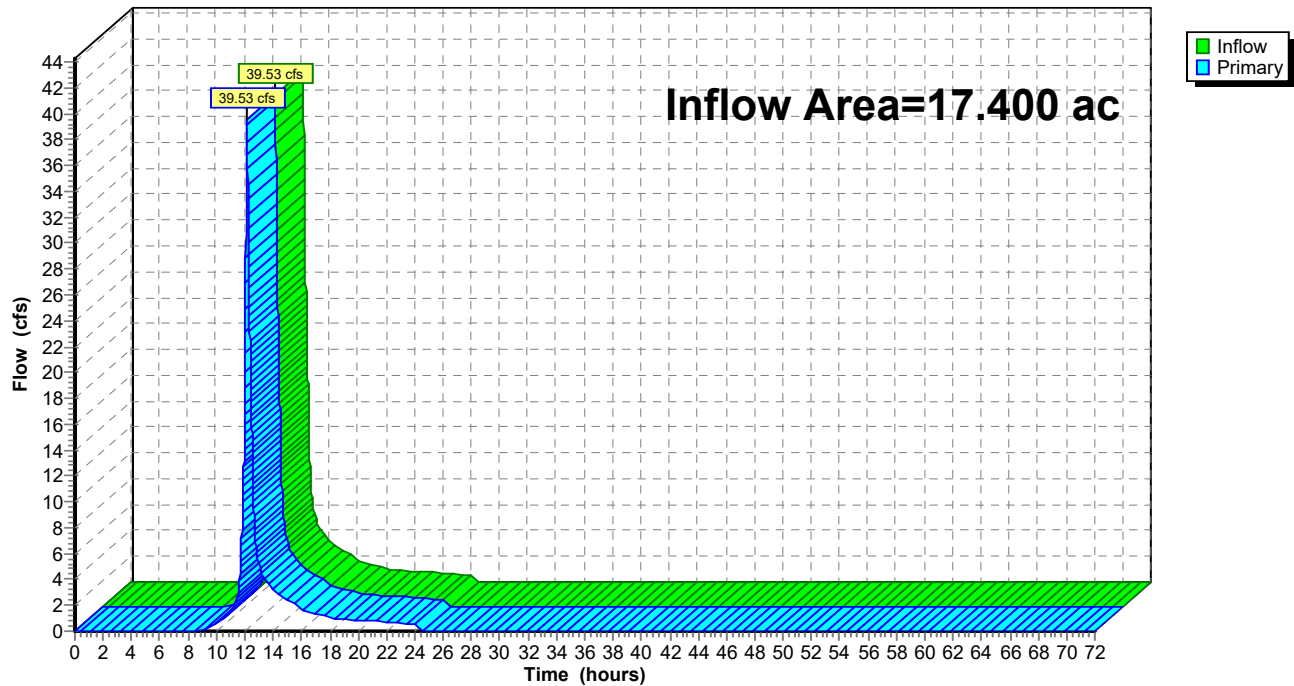
Summary for Link POA: POA

Inflow Area = 17.400 ac, 44.72% Impervious, Inflow Depth = 2.29" for 10 yr event
Inflow = 39.53 cfs @ 12.16 hrs, Volume= 3.325 af
Primary = 39.53 cfs @ 12.16 hrs, Volume= 3.325 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link POA: POA

Hydrograph



17211.00 Arlington HS - Existing Conditions

Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment EX-WS-1: Existing Watershed 1

Runoff = 52.75 cfs @ 12.15 hrs, Volume= 4.429 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
* 5.051	98	Impervious
2.731	98	Roofs, HSG B
9.598	61	>75% Grass cover, Good, HSG B
0.020	55	Woods, Good, HSG B
17.400	78	Weighted Average
9.618		55.28% Pervious Area
7.782		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, 50' SF Grass: Short n= 0.150 P2= 3.20"
1.9	220	0.0140	1.90		Shallow Concentrated Flow, 220' SCF Unpaved Kv= 16.1 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, 140' SCF (paved) Paved Kv= 20.3 fps
0.1	20	0.0100	4.91	3.86	Pipe Channel, 12" Pipe Flow 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.7	500	0.0050	11.67	466.77	Pipe Channel, Box Culvert Flow 96.0" x 60.0" Box Area= 40.0 sf Perim= 26.0' r= 1.54' n= 0.012
11.0	930	Total			

17211.00 Arlington HS - Existing Conditions

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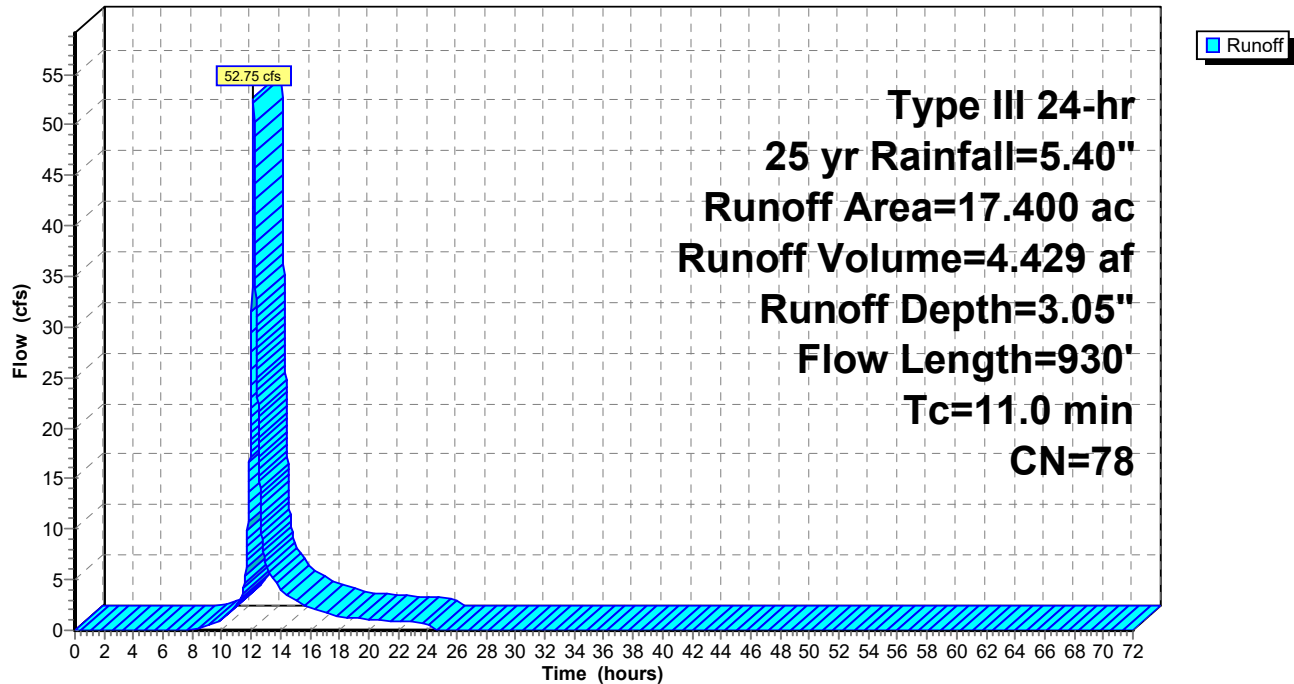
Type III 24-hr 25 yr Rainfall=5.40"

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Subcatchment EX-WS-1: Existing Watershed 1

Hydrograph



17211.00 Arlington HS - Existing Conditions

Prepared by Samiotes Engineering

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Type III 24-hr 25 yr Rainfall=5.40"

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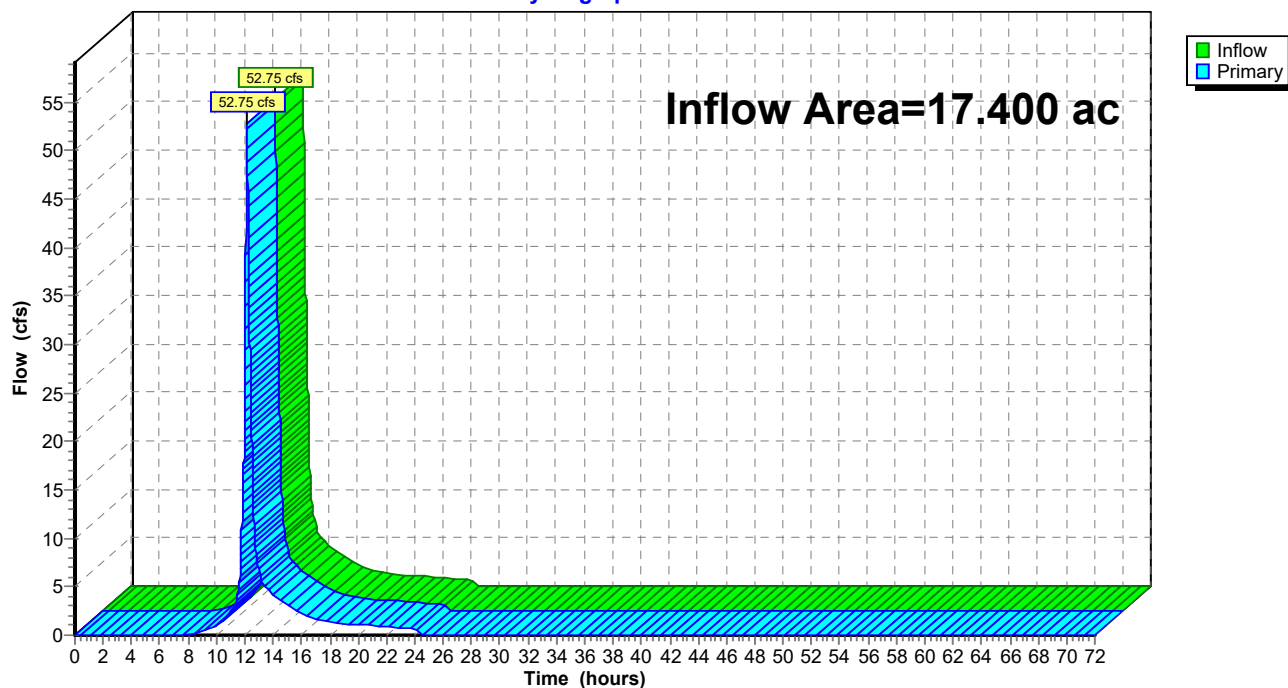
Summary for Link POA: POA

Inflow Area = 17.400 ac, 44.72% Impervious, Inflow Depth = 3.05" for 25 yr event
Inflow = 52.75 cfs @ 12.15 hrs, Volume= 4.429 af
Primary = 52.75 cfs @ 12.15 hrs, Volume= 4.429 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link POA: POA

Hydrograph



17211.00 Arlington HS - Existing Conditions

Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment EX-WS-1: Existing Watershed 1

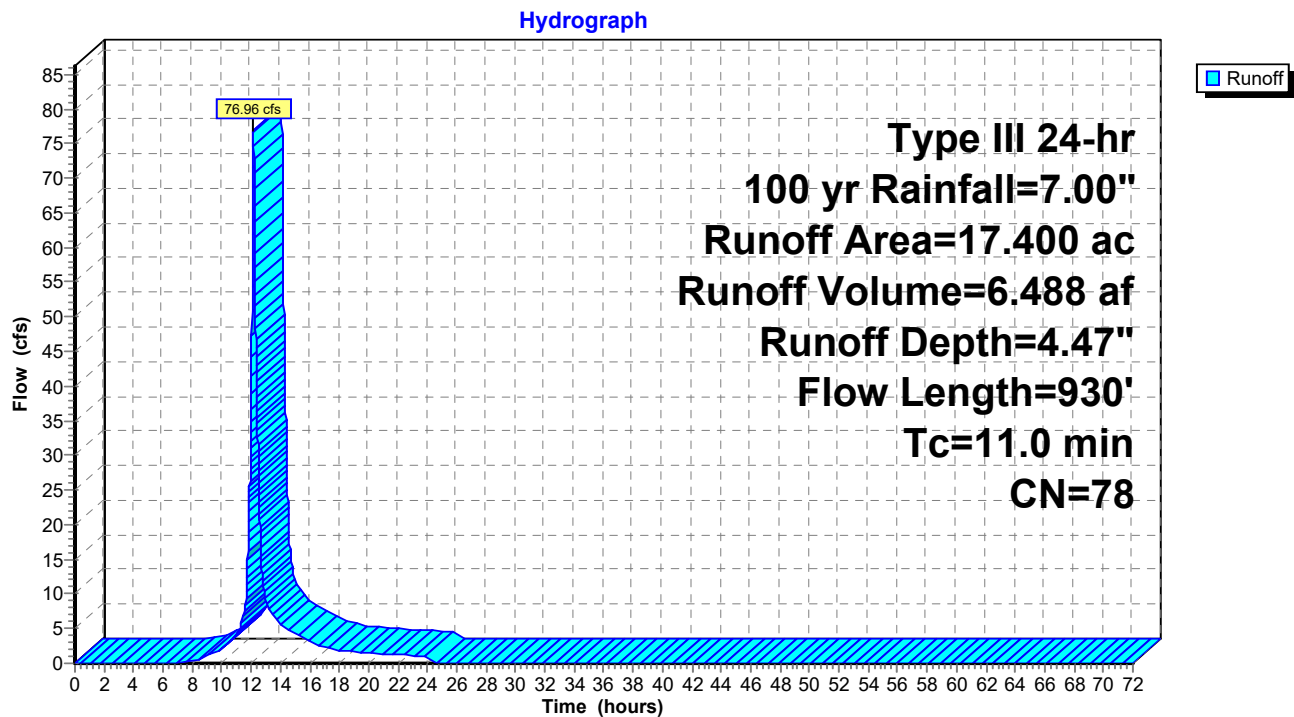
Runoff = 76.96 cfs @ 12.15 hrs, Volume= 6.488 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
* 5.051	98	Impervious
2.731	98	Roofs, HSG B
9.598	61	>75% Grass cover, Good, HSG B
0.020	55	Woods, Good, HSG B
17.400	78	Weighted Average
9.618		55.28% Pervious Area
7.782		44.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, 50' SF Grass: Short n= 0.150 P2= 3.20"
1.9	220	0.0140	1.90		Shallow Concentrated Flow, 220' SCF Unpaved Kv= 16.1 fps
0.9	140	0.0150	2.49		Shallow Concentrated Flow, 140' SCF (paved) Paved Kv= 20.3 fps
0.1	20	0.0100	4.91	3.86	Pipe Channel, 12" Pipe Flow 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.7	500	0.0050	11.67	466.77	Pipe Channel, Box Culvert Flow 96.0" x 60.0" Box Area= 40.0 sf Perim= 26.0' r= 1.54' n= 0.012
11.0	930	Total			

Subcatchment EX-WS-1: Existing Watershed 1



17211.00 Arlington HS - Existing Conditions

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Type III 24-hr 100 yr Rainfall=7.00"

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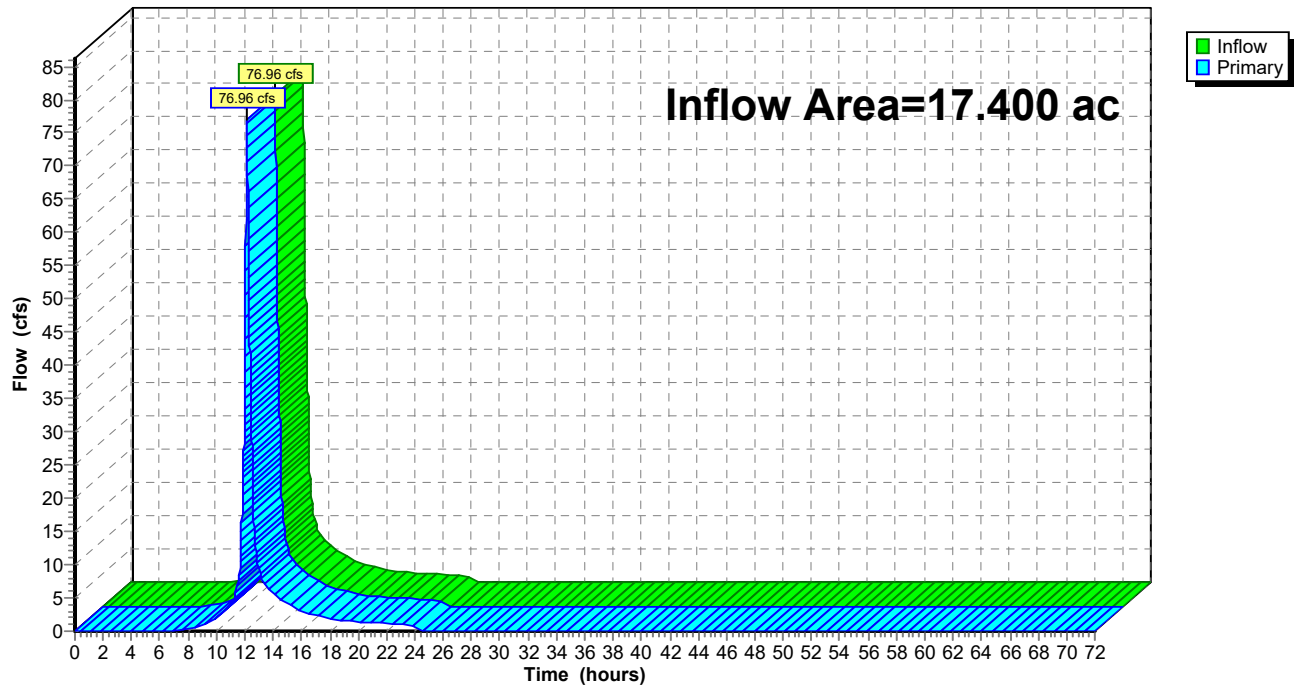
Summary for Link POA: POA

Inflow Area = 17.400 ac, 44.72% Impervious, Inflow Depth = 4.47" for 100 yr event
Inflow = 76.96 cfs @ 12.15 hrs, Volume= 6.488 af
Primary = 76.96 cfs @ 12.15 hrs, Volume= 6.488 af, Atten= 0%, Lag= 0.0 min

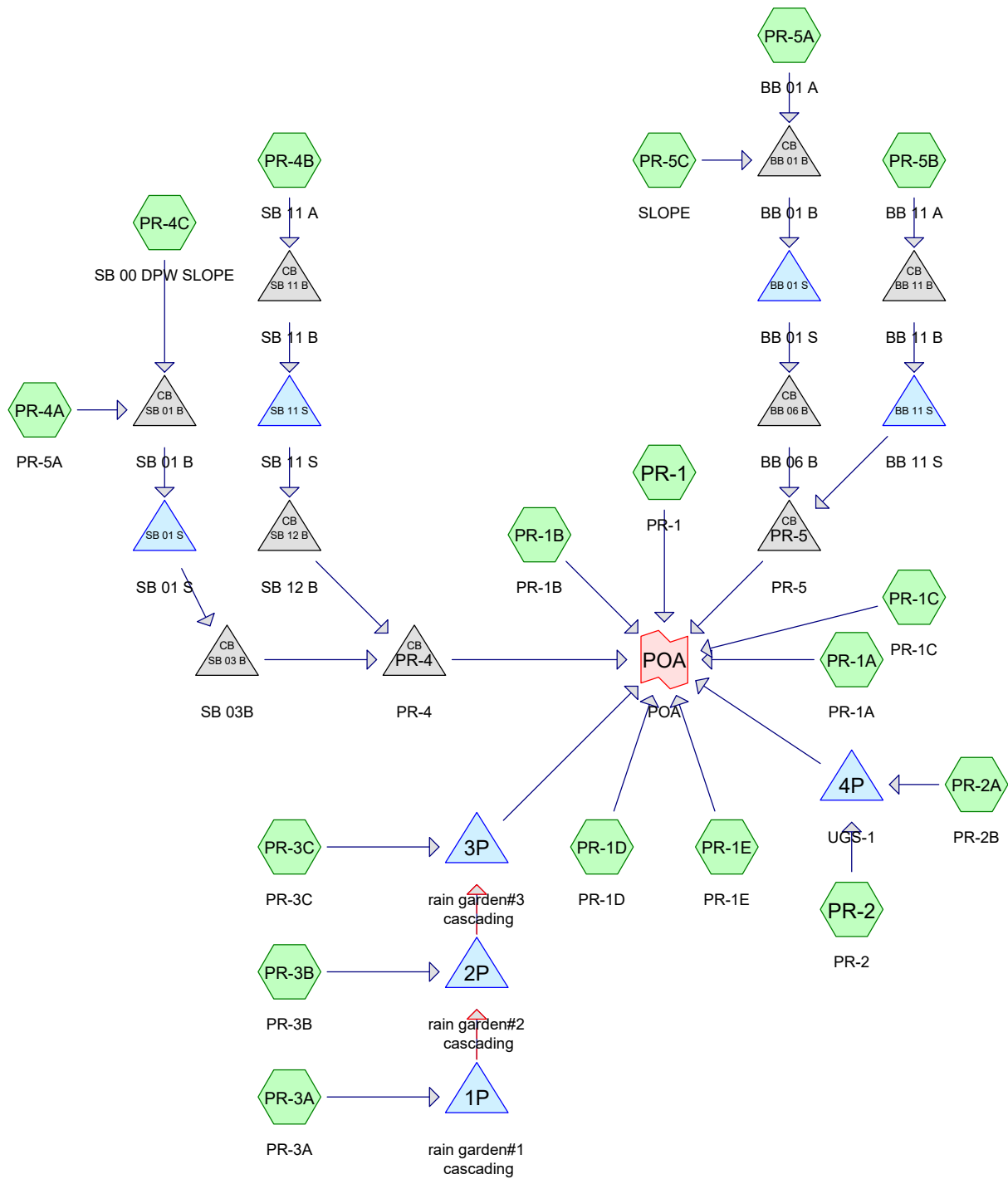
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link POA: POA

Hydrograph



APPENDIX 2:
Proposed Hydrology Calculations



Routing Diagram for 17211.00 Arlington HS - Proposed Conditions

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.695	61	>75% Grass cover, Good, HSG B (PR-1, PR-1A, PR-1C, PR-1E, PR-2, PR-3A, PR-3B, PR-3C, PR-4C, PR-5C)
4.964	98	Paved parking, HSG B (PR-1, PR-1A, PR-1C, PR-1E, PR-2, PR-3A, PR-3B)
3.627	98	Roofs, HSG B (PR-1B, PR-1D, PR-2A)
4.056	85	SYNTHETIC TURF- PAD- LINER (PR-4A, PR-4B, PR-5A, PR-5B)
0.025	98	Unconnected pavement, HSG B (PR-4C)
0.014	98	Unconnected roofs, HSG B (PR-5C)
0.020	55	Woods, Good, HSG B (PR-1C)
17.400	85	TOTAL AREA

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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-1: PR-1

Runoff = 6.98 cfs @ 12.13 hrs, Volume= 0.564 af, Depth= 1.54"

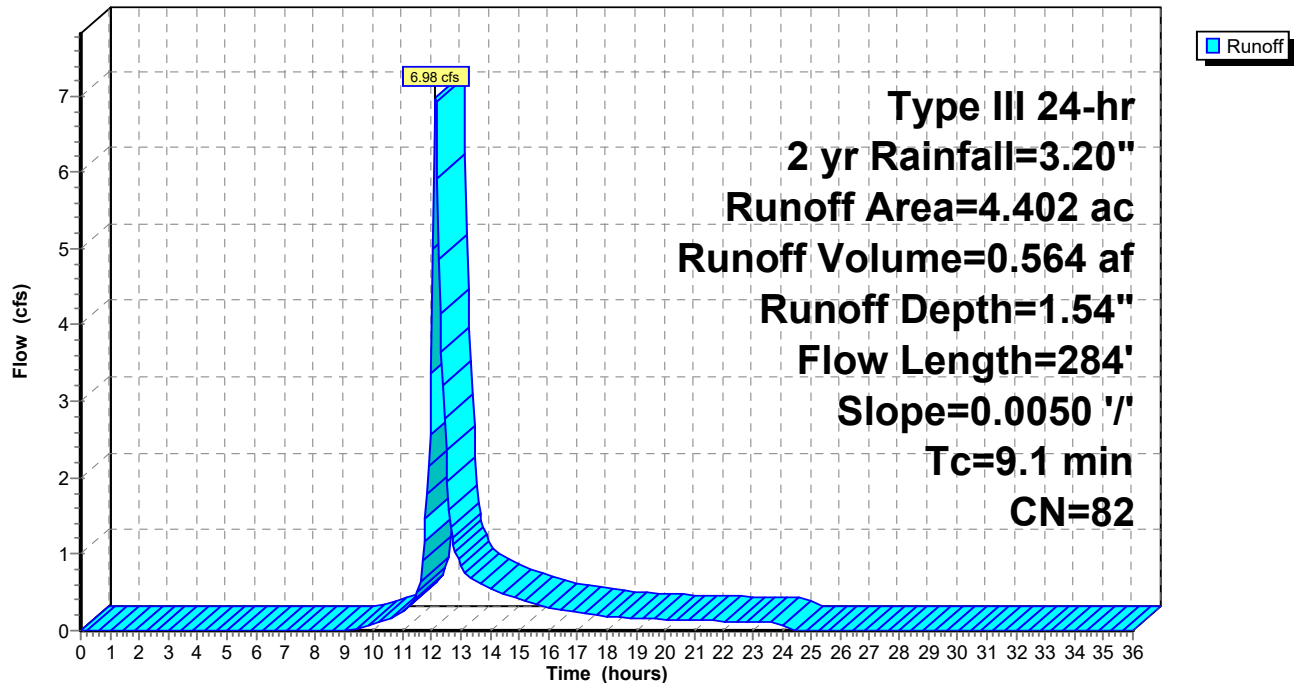
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
1.892	61	>75% Grass cover, Good, HSG B
2.510	98	Paved parking, HSG B
4.402	82	Weighted Average
1.892		42.98% Pervious Area
2.510		57.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.69		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.20"
7.9	234	0.0050	0.49		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
9.1	284	Total			

Subcatchment PR-1: PR-1

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-1A: PR-1A

Runoff = 1.21 cfs @ 12.09 hrs, Volume= 0.090 af, Depth= 2.26"

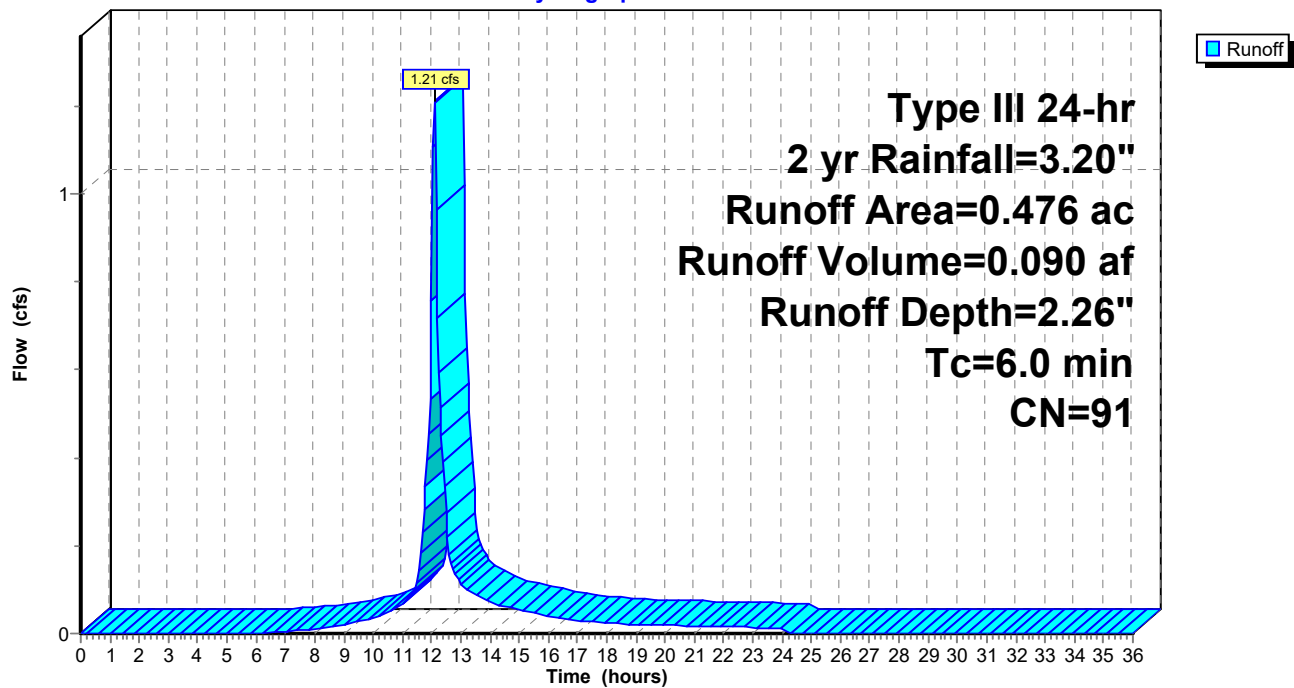
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.090	61	>75% Grass cover, Good, HSG B
0.386	98	Paved parking, HSG B
0.476	91	Weighted Average
0.090		18.91% Pervious Area
0.386		81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1A: PR-1A

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-1B: PR-1B

Runoff = 5.69 cfs @ 12.09 hrs, Volume= 0.464 af, Depth= 2.97"

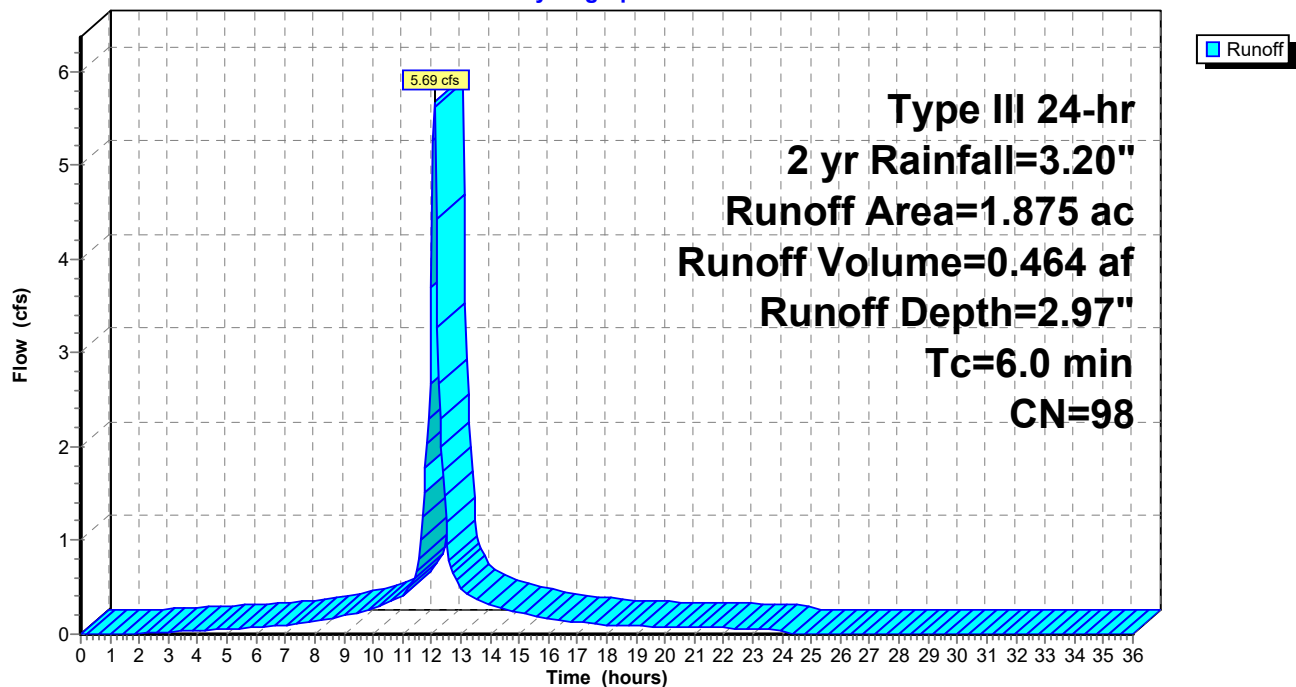
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
1.875	98	Roofs, HSG B
1.875		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1B: PR-1B

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-1C: PR-1C

Runoff = 0.56 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 1.09"

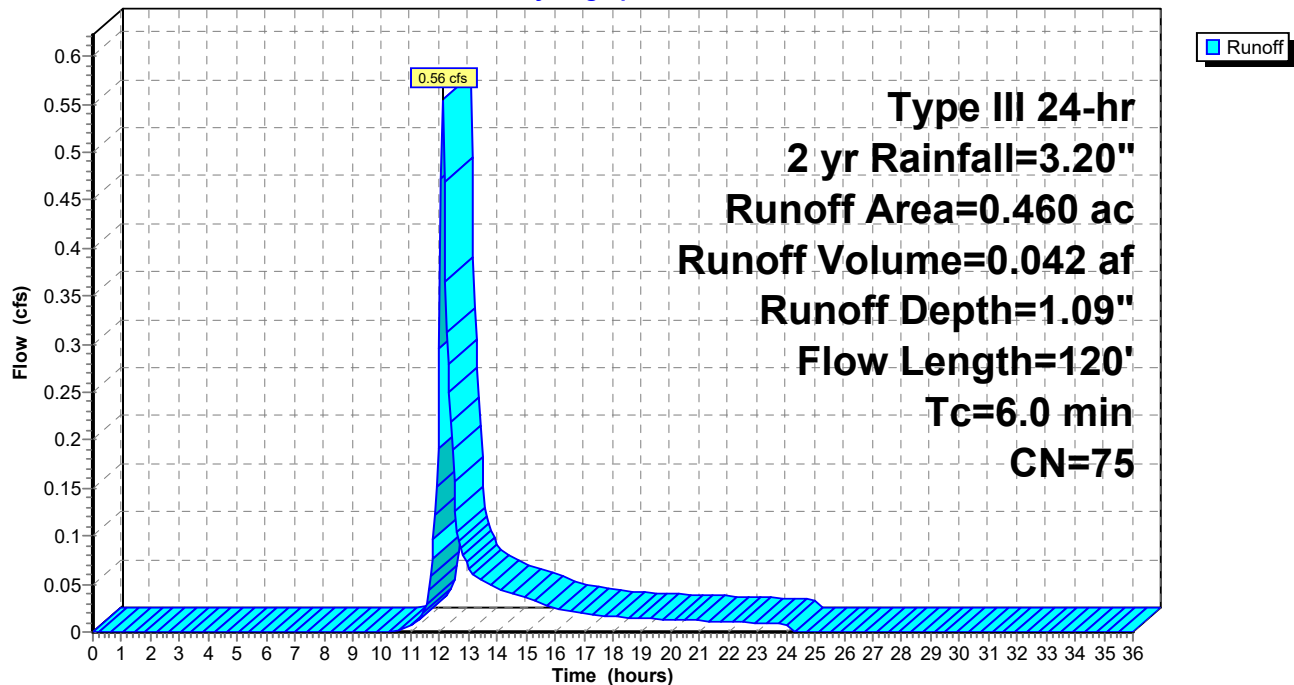
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.020	55	Woods, Good, HSG B
0.260	61	>75% Grass cover, Good, HSG B
0.180	98	Paved parking, HSG B
0.460	75	Weighted Average
0.280		60.87% Pervious Area
0.180		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	20	0.0700	0.09		Sheet Flow, 20' SF Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	40	0.5000	0.35		Sheet Flow, 30' SF Grass: Dense n= 0.240 P2= 3.20"
0.1	12	0.0100	1.61		Shallow Concentrated Flow, 12' SCF Unpaved Kv= 16.1 fps
0.2	48	0.0400	4.06		Shallow Concentrated Flow, 48' SCF Paved Kv= 20.3 fps
5.8	120	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-1C: PR-1C

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-1D: PR-1D

Runoff = 4.55 cfs @ 12.09 hrs, Volume= 0.371 af, Depth= 2.97"

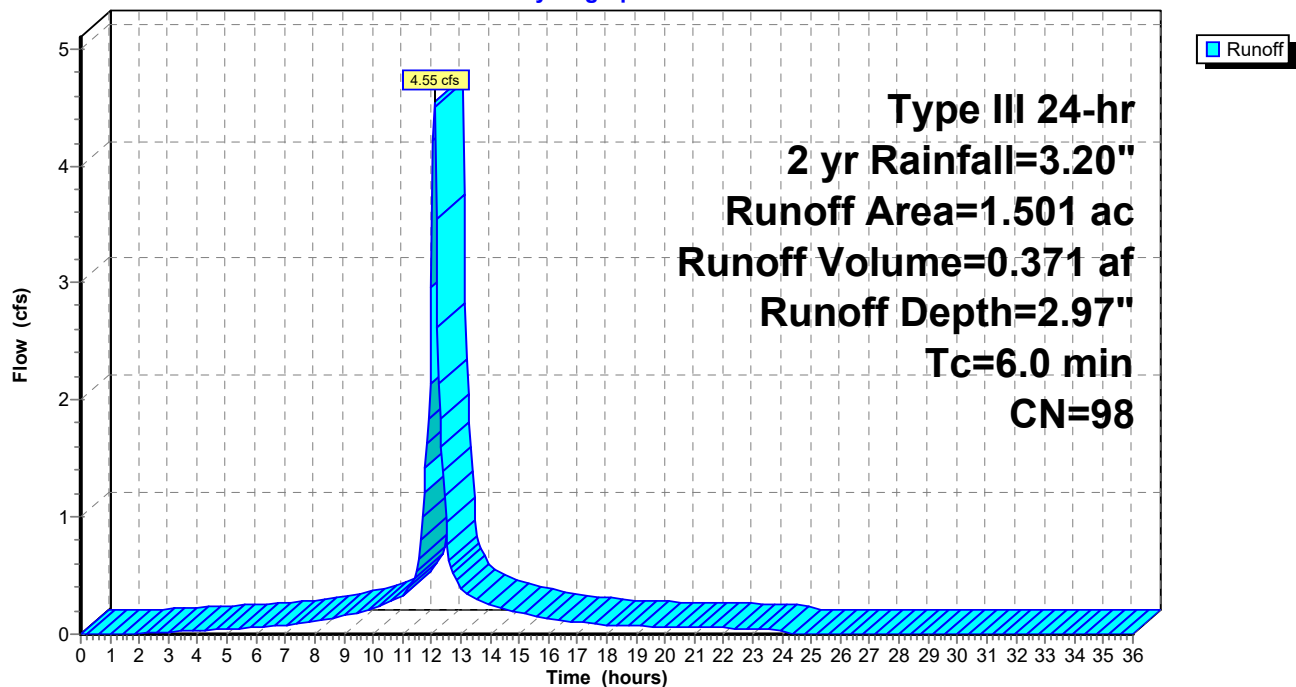
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
1.501	98	Roofs, HSG B
1.501		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1D: PR-1D

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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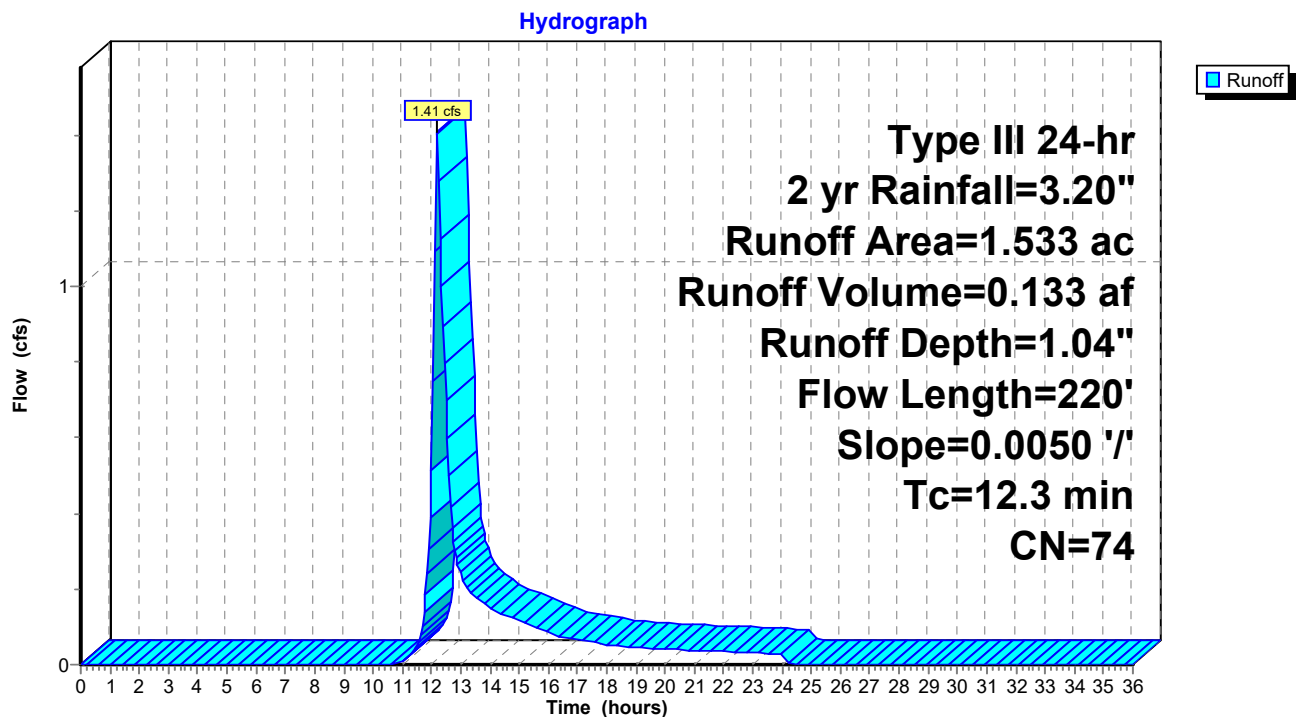
Summary for Subcatchment PR-1E: PR-1E

Runoff = 1.41 cfs @ 12.19 hrs, Volume= 0.133 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
1.000	61	>75% Grass cover, Good, HSG B
0.533	98	Paved parking, HSG B
1.533	74	Weighted Average
1.000		65.23% Pervious Area
0.533		34.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	50	0.0050	0.09		Sheet Flow, 50' SF
					Grass: Short n= 0.150 P2= 3.20"
2.5	170	0.0050	1.14		Shallow Concentrated Flow, 170' SCF
					Unpaved Kv= 16.1 fps
12.3	220	Total			

Subcatchment PR-1E: PR-1E

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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-2: PR-2

Runoff = 2.41 cfs @ 12.10 hrs, Volume= 0.176 af, Depth= 1.47"

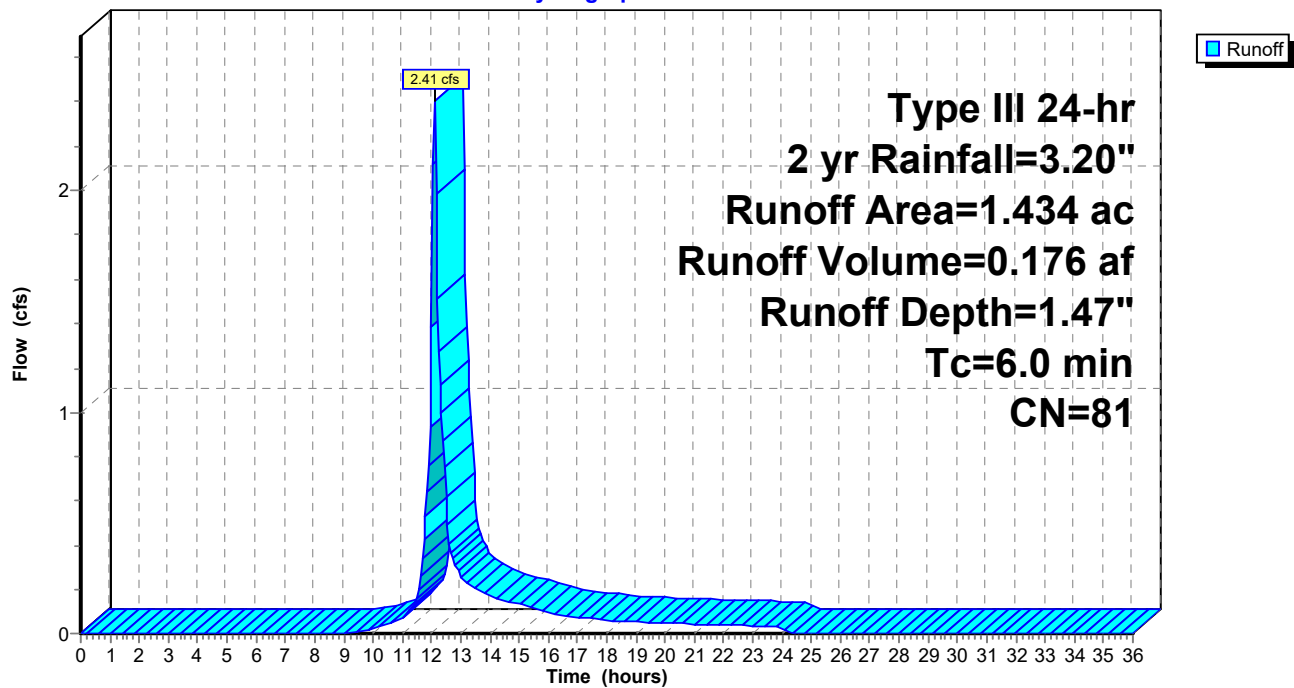
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.672	61	>75% Grass cover, Good, HSG B
0.762	98	Paved parking, HSG B
1.434	81	Weighted Average
0.672		46.86% Pervious Area
0.762		53.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: PR-2

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-2A: PR-2B

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.062 af, Depth= 2.97"

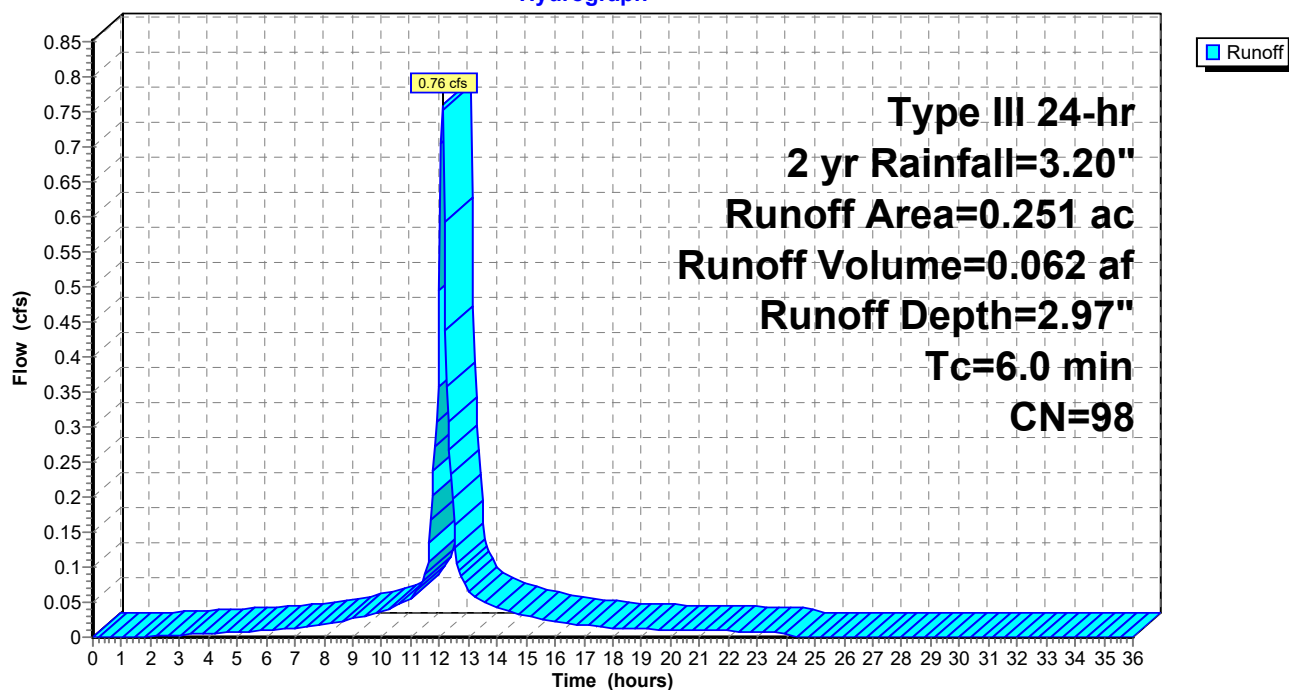
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.251	98	Roofs, HSG B
0.251		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2A: PR-2B

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-3A: PR-3A

Runoff = 1.46 cfs @ 12.09 hrs, Volume= 0.106 af, Depth= 1.76"

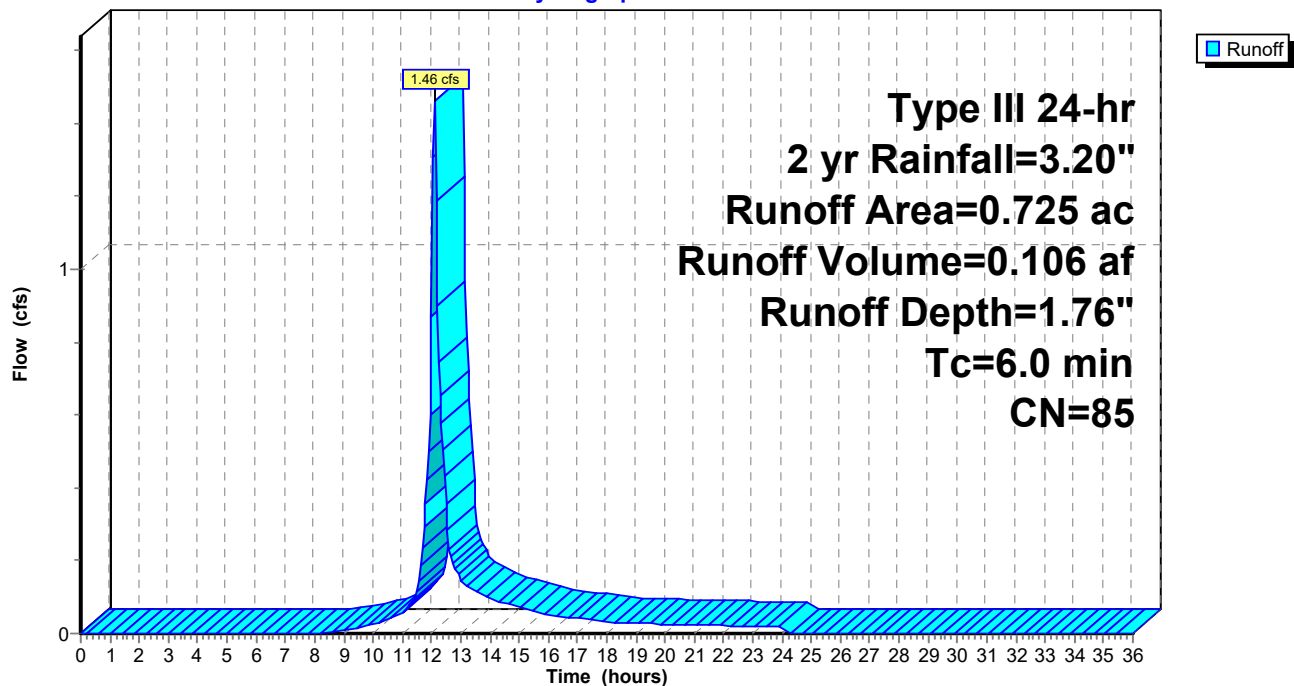
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.249	61	>75% Grass cover, Good, HSG B
0.476	98	Paved parking, HSG B
0.725	85	Weighted Average
0.249		34.34% Pervious Area
0.476		65.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3A: PR-3A

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-3B: PR-3B

Runoff = 0.37 cfs @ 12.10 hrs, Volume= 0.027 af, Depth= 1.34"

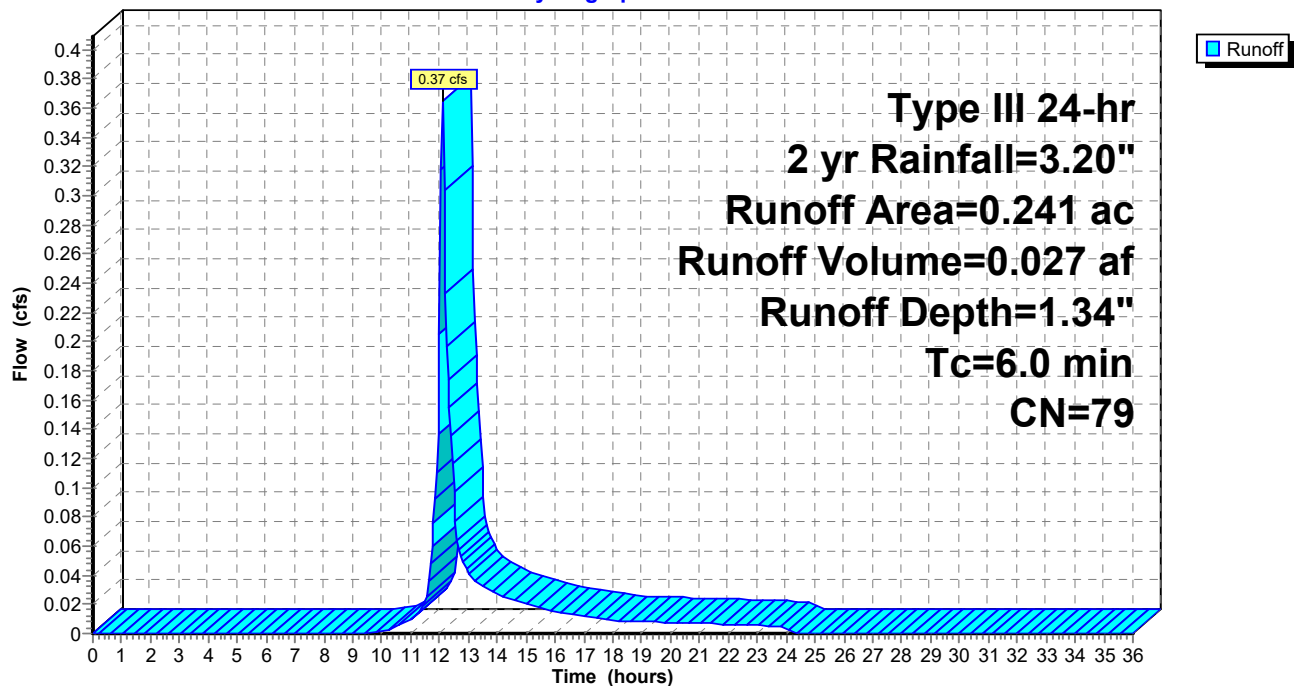
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.124	61	>75% Grass cover, Good, HSG B
0.117	98	Paved parking, HSG B
0.241	79	Weighted Average
0.124		51.45% Pervious Area
0.117		48.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3B: PR-3B

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-3C: PR-3C

Runoff = 0.06 cfs @ 12.13 hrs, Volume= 0.007 af, Depth= 0.44"

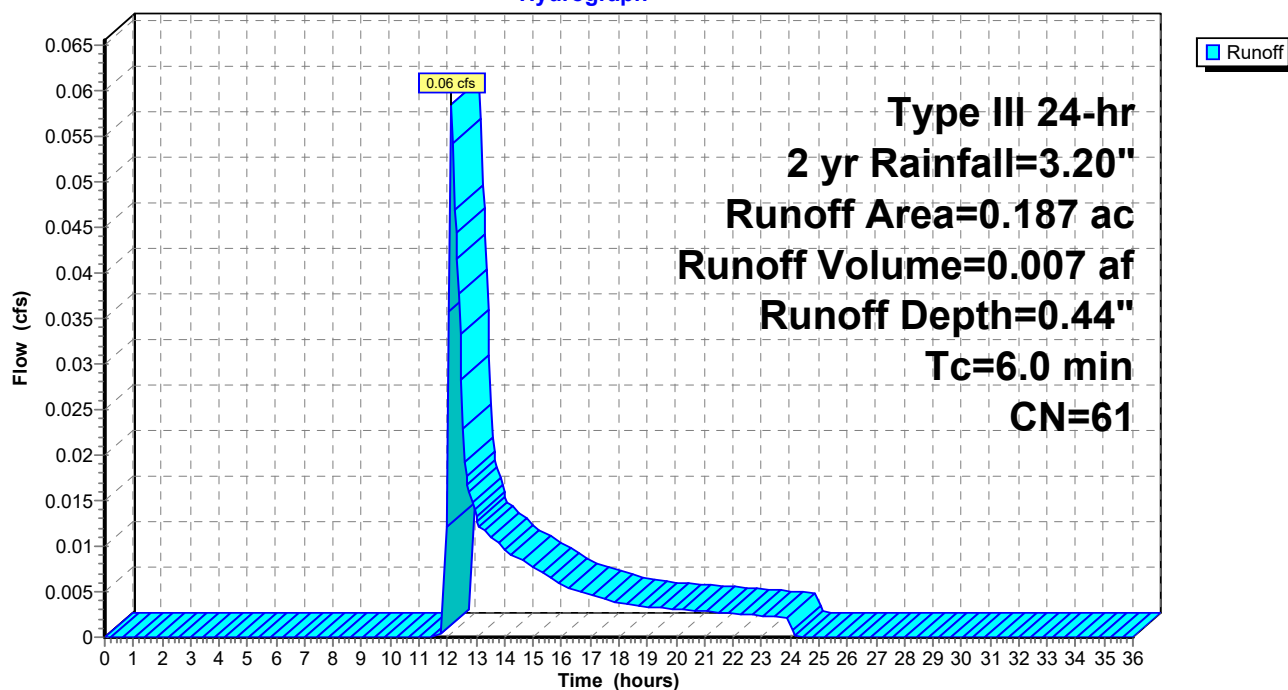
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
0.187	61	>75% Grass cover, Good, HSG B
0.187		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3C: PR-3C

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-4A: PR-5A

Runoff = 0.91 cfs @ 12.60 hrs, Volume= 0.138 af, Depth= 1.76"

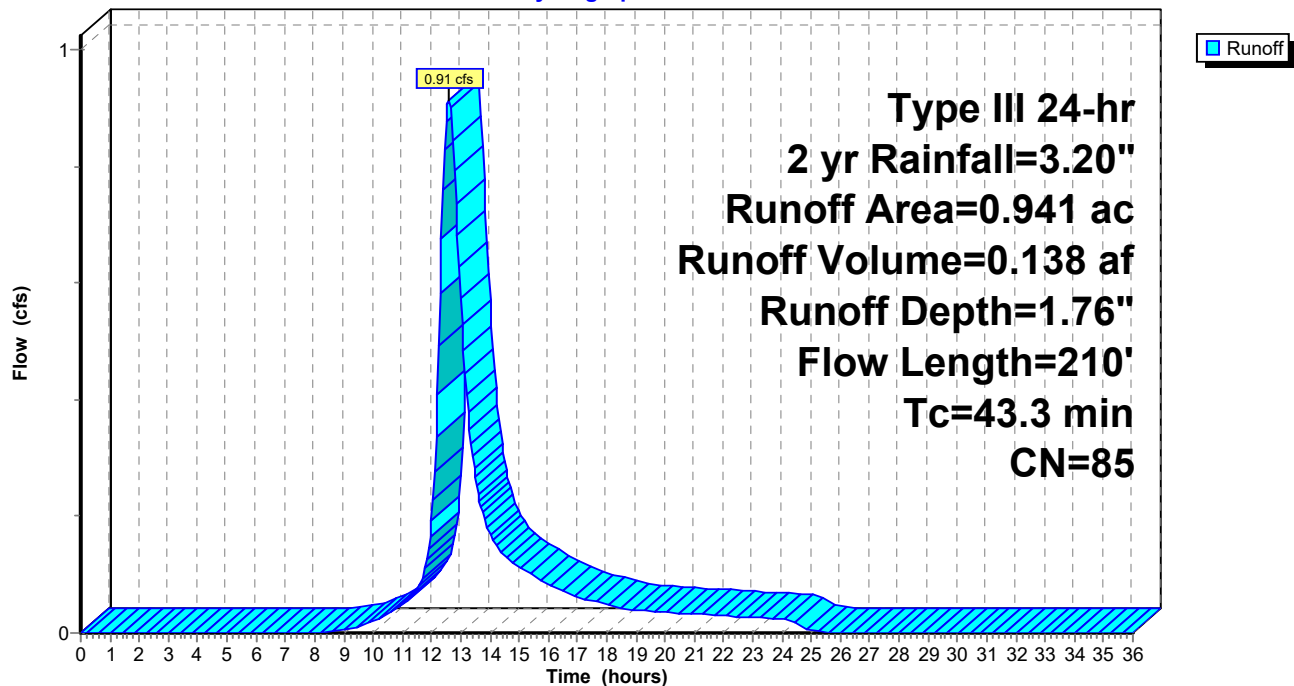
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
* 0.941	85	SYNTHETIC TURF- PAD- LINER
0.941		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	110	0.0055	0.05		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
43.3	210	Total			

Subcatchment PR-4A: PR-5A

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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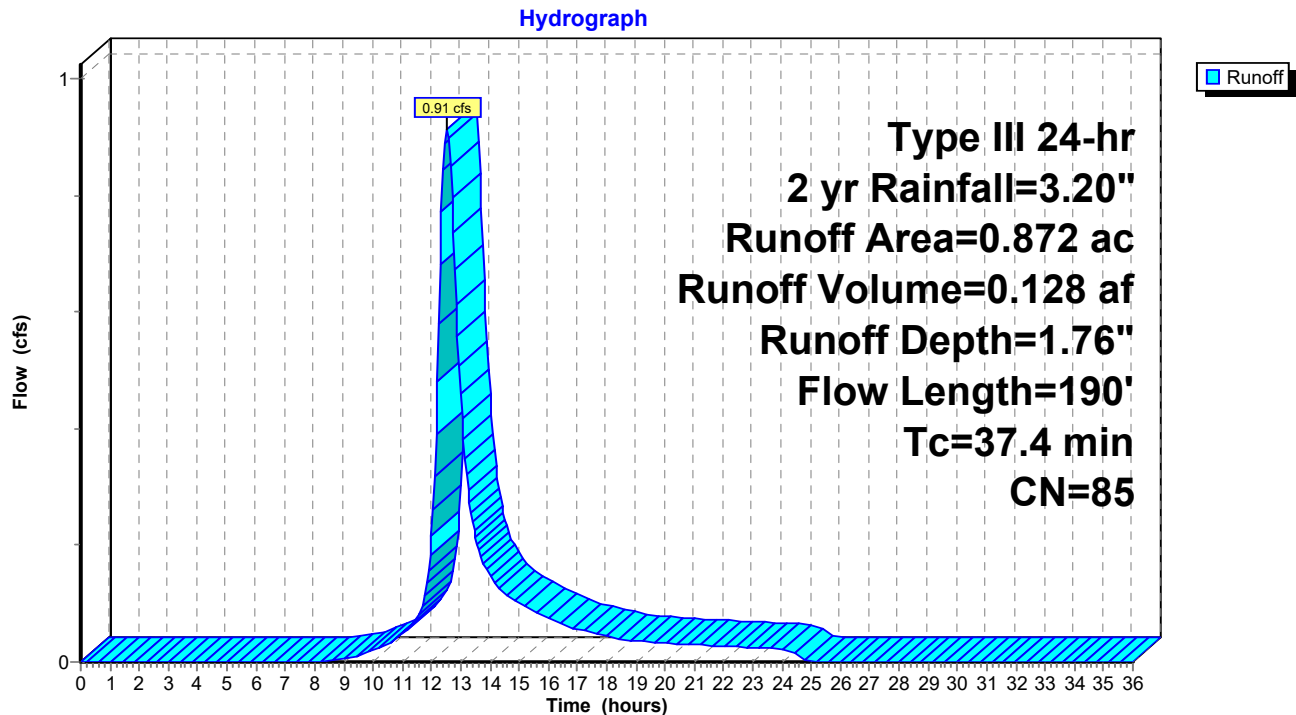
Summary for Subcatchment PR-4B: SB 11 A

Runoff = 0.91 cfs @ 12.52 hrs, Volume= 0.128 af, Depth= 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Description
* 0.872	85	SYNTHETIC TURF- PAD- LINER
0.872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.7	90	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
37.4	190	Total			

Subcatchment PR-4B: SB 11 A

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Summary for Subcatchment PR-4C: SB 00 DPW SLOPE

Runoff = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af, Depth= 0.60"

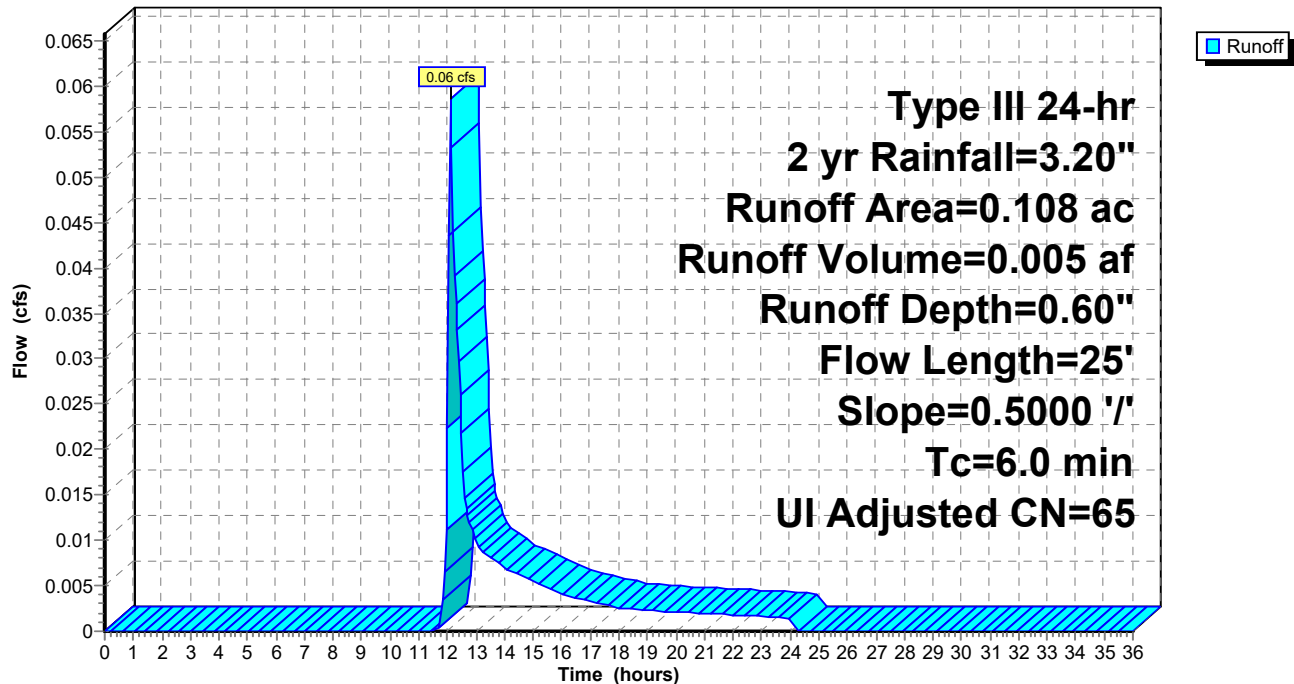
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (ac)	CN	Adj	Description
0.025	98		Unconnected pavement, HSG B
0.083	61		>75% Grass cover, Good, HSG B
0.108	70	65	Weighted Average, UI Adjusted
0.083			76.85% Pervious Area
0.025			23.15% Impervious Area
0.025			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	25	0.5000	0.32		Sheet Flow, SLOPING LAND
					Grass: Dense n= 0.240 P2= 3.20"
1.3	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-4C: SB 00 DPW SLOPE

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-5A: BB 01 A

Runoff = 0.78 cfs @ 12.28 hrs, Volume= 0.082 af, Depth= 1.76"

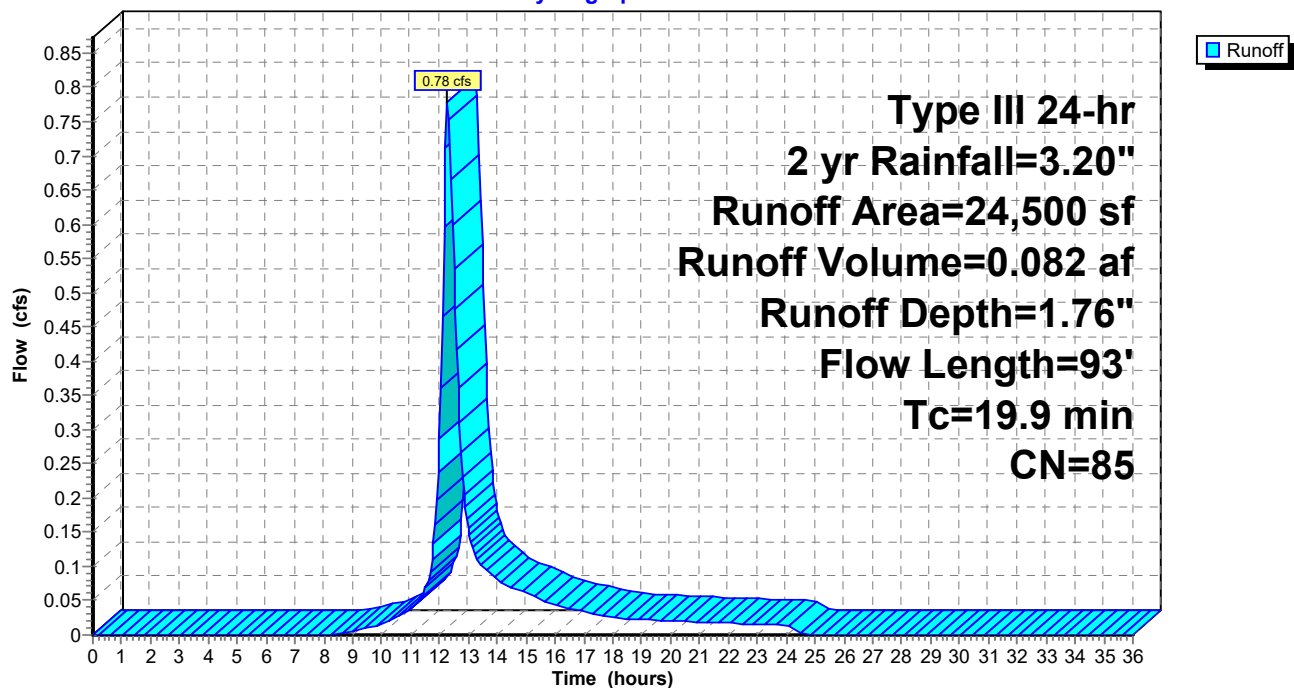
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
*	24,500	85	SYNTHETIC TURF- PAD- LINER
	24,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	46	0.0067	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
19.9	93	Total			

Subcatchment PR-5A: BB 01 A

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Subcatchment PR-5B: BB 11 A

Runoff = 1.27 cfs @ 12.90 hrs, Volume= 0.246 af, Depth= 1.76"

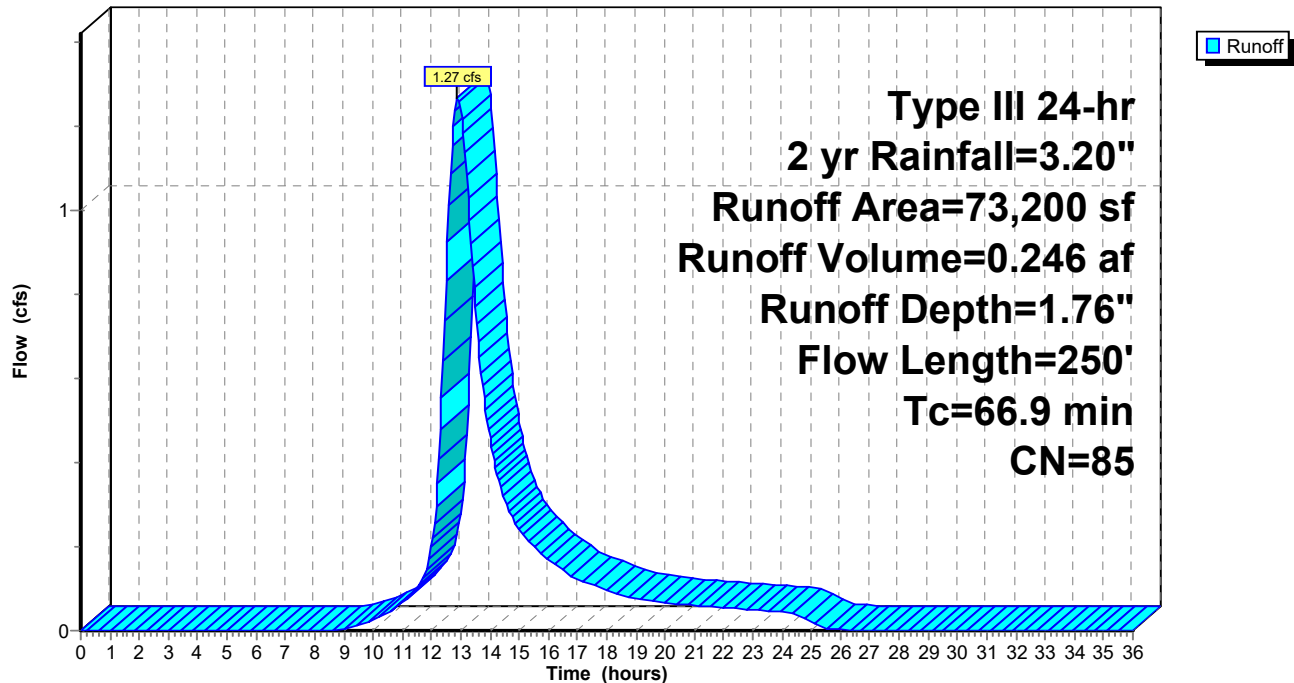
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
*	73,200	85	SYNTHETIC TURF- PAD- LINER
	73,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.1	53	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
43.1	150	0.0083	0.06		Sheet Flow, SYNTHETIC TURF Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
66.9	250	Total			

Subcatchment PR-5B: BB 11 A

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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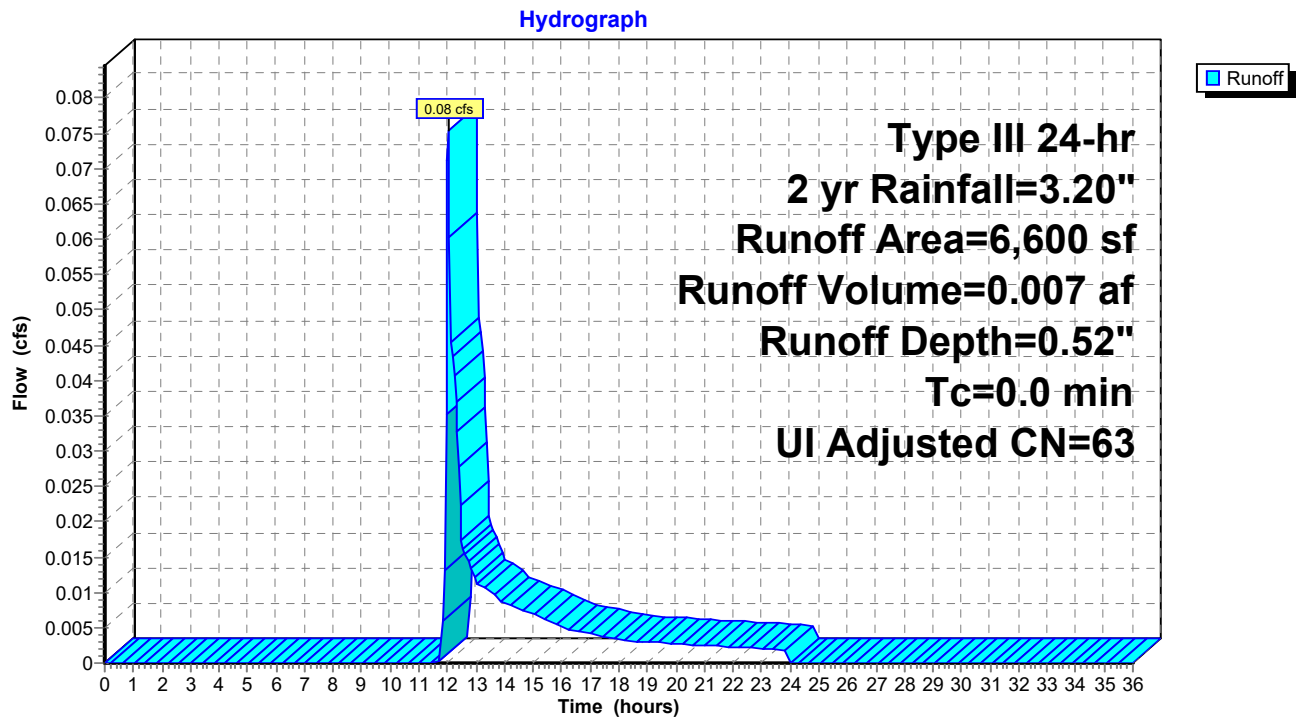
Summary for Subcatchment PR-5C: SLOPE

Runoff = 0.08 cfs @ 12.02 hrs, Volume= 0.007 af, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (sf)	CN	Adj	Description
600	98		Unconnected roofs, HSG B
6,000	61		>75% Grass cover, Good, HSG B
6,600	64	63	Weighted Average, UI Adjusted
6,000			90.91% Pervious Area
600			9.09% Impervious Area
600			100.00% Unconnected

Subcatchment PR-5C: SLOPE



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond 1P: rain garden#1 cascading

Inflow Area = 0.725 ac, 65.66% Impervious, Inflow Depth = 1.76" for 2 yr event
 Inflow = 1.46 cfs @ 12.09 hrs, Volume= 0.106 af
 Outflow = 1.44 cfs @ 12.11 hrs, Volume= 0.104 af, Atten= 1%, Lag= 0.9 min
 Primary = 1.44 cfs @ 12.11 hrs, Volume= 0.104 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 61.77' @ 12.11 hrs Surf.Area= 441 sf Storage= 442 cf

Flood Elev= 63.00' Surf.Area= 660 sf Storage= 1,132 cf

Plug-Flow detention time= 76.0 min calculated for 0.104 af (98% of inflow)

Center-of-Mass det. time= 66.2 min (892.3 - 826.1)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,048 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 1,348 cf Overall - 300 cf Embedded = 1,048 cf
#2	58.50'	30 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 75 cf Overall x 40.0% Voids
#3	59.00'	50 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 199 cf Overall x 25.0% Voids
#4	60.33'	5 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 26 cf Overall x 20.0% Voids
		1,132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
60.50	150	300	300
61.00	236	97	397
62.00	503	370	766
63.00	660	582	1,348

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
59.00	150	75	75

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	150	0	0
60.33	150	199	199

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.33	150	0	0
60.50	150	26	26

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Type III 24-hr 2 yr Rainfall=3.20"

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Device	Routing	Invert	Outlet Devices
#1	Device 3	58.50'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	62.00'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	58.50'	8.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 58.50' / 58.40' S= 0.0050 ' / Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Device 3	61.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.41 cfs @ 12.11 hrs HW=61.77' TW=54.04' (Dynamic Tailwater)

← **3=Culvert** (Passes 1.41 cfs of 2.88 cfs potential flow)

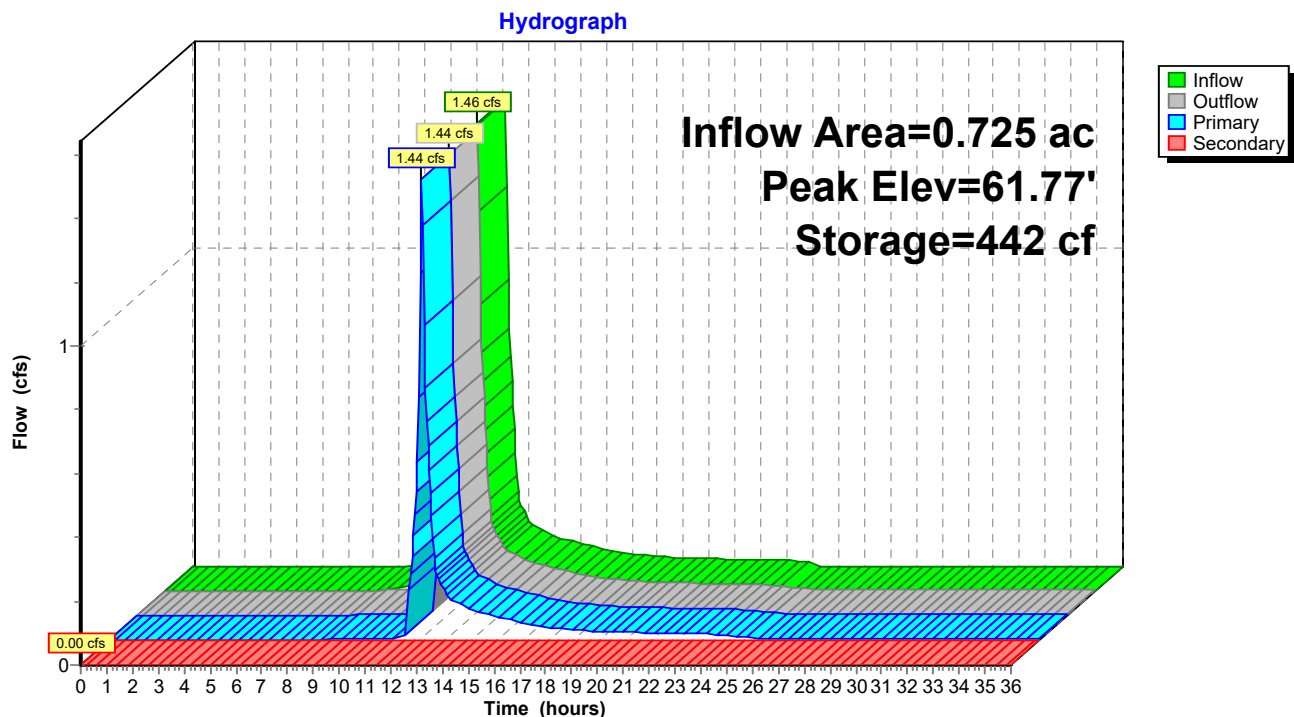
← **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

← **4=Orifice/Grate** (Weir Controls 1.40 cfs @ 1.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.50' TW=51.00' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: rain garden#1 cascading



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond 2P: rain garden#2 cascading

Inflow Area = 0.966 ac, 61.39% Impervious, Inflow Depth > 1.63" for 2 yr event
 Inflow = 1.81 cfs @ 12.11 hrs, Volume= 0.131 af
 Outflow = 1.72 cfs @ 12.13 hrs, Volume= 0.124 af, Atten= 5%, Lag= 1.7 min
 Primary = 1.72 cfs @ 12.13 hrs, Volume= 0.124 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 54.05' @ 12.13 hrs Surf.Area= 727 sf Storage= 811 cf

Flood Elev= 55.00' Surf.Area= 1,326 sf Storage= 1,784 cf

Plug-Flow detention time= 120.1 min calculated for 0.124 af (94% of inflow)

Center-of-Mass det. time= 74.7 min (957.5 - 882.8)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,557 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 2,357 cf Overall - 800 cf Embedded = 1,557 cf
#2	51.00'	80 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 200 cf Overall x 40.0% Voids
#3	51.50'	133 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 532 cf Overall x 25.0% Voids
#4	52.83'	14 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 68 cf Overall x 20.0% Voids
		1,784 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
53.00	400	800	800
54.00	694	547	1,347
55.00	1,326	1,010	2,357

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
51.50	400	200	200

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.50	400	0	0
52.83	400	532	532

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.83	400	0	0
53.00	400	68	68

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Type III 24-hr 2 yr Rainfall=3.20"

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Device	Routing	Invert	Outlet Devices
#1	Device 3	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	54.50'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	51.00'	12.0" Round Culvert L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 51.00' / 50.88' S= 0.0048 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Device 3	53.75'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.68 cfs @ 12.13 hrs HW=54.05' TW=48.39' (Dynamic Tailwater)

← **3=Culvert** (Passes 1.68 cfs of 6.04 cfs potential flow)

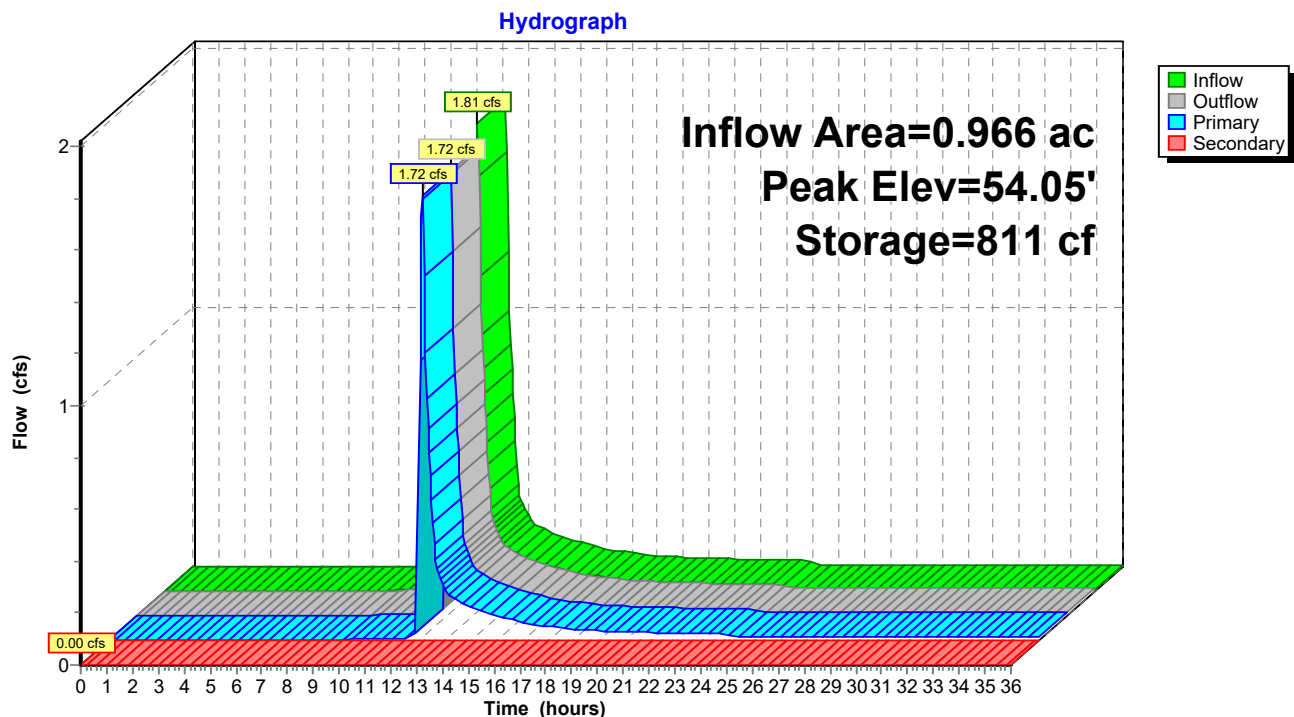
← **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

← **4=Orifice/Grate** (Weir Controls 1.67 cfs @ 1.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.00' TW=46.00' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: rain garden#2 cascading



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Summary for Pond 3P: rain garden#3 cascading

Inflow Area = 1.153 ac, 51.43% Impervious, Inflow Depth > 1.36" for 2 yr event
 Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.131 af
 Outflow = 1.51 cfs @ 12.26 hrs, Volume= 0.117 af, Atten= 15%, Lag= 7.3 min
 Primary = 1.51 cfs @ 12.26 hrs, Volume= 0.117 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 48.86' @ 12.26 hrs Surf.Area= 908 sf Storage= 991 cf

Flood Elev= 50.00' Surf.Area= 1,373 sf Storage= 2,283 cf

Plug-Flow detention time= 183.6 min calculated for 0.116 af (89% of inflow)

Center-of-Mass det. time= 87.4 min (1,042.7 - 955.3)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	1,944 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 3,144 cf Overall - 1,200 cf Embedded = 1,944 cf
#2	46.00'	120 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 300 cf Overall x 40.0% Voids
#3	46.50'	199 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 798 cf Overall x 25.0% Voids
#4	47.83'	20 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 102 cf Overall x 20.0% Voids
		2,283 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
48.00	600	1,200	1,200
49.00	957	779	1,979
50.00	1,373	1,165	3,144

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
46.50	600	300	300

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.50	600	0	0
47.83	600	798	798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.83	600	0	0
48.00	600	102	102

Device	Routing	Invert	Outlet Devices
#1	Device 3	46.00'	1.020 in/hr Exfiltration over Surface area
#2	Device 3	48.75'	24.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

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#3 Primary

46.00' 15.0" Round Culvert

L= 26.0' CPP, projecting, no headwall, $K_e = 0.900$

Inlet / Outlet Invert= 46.00' / 45.87' S= 0.0050 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

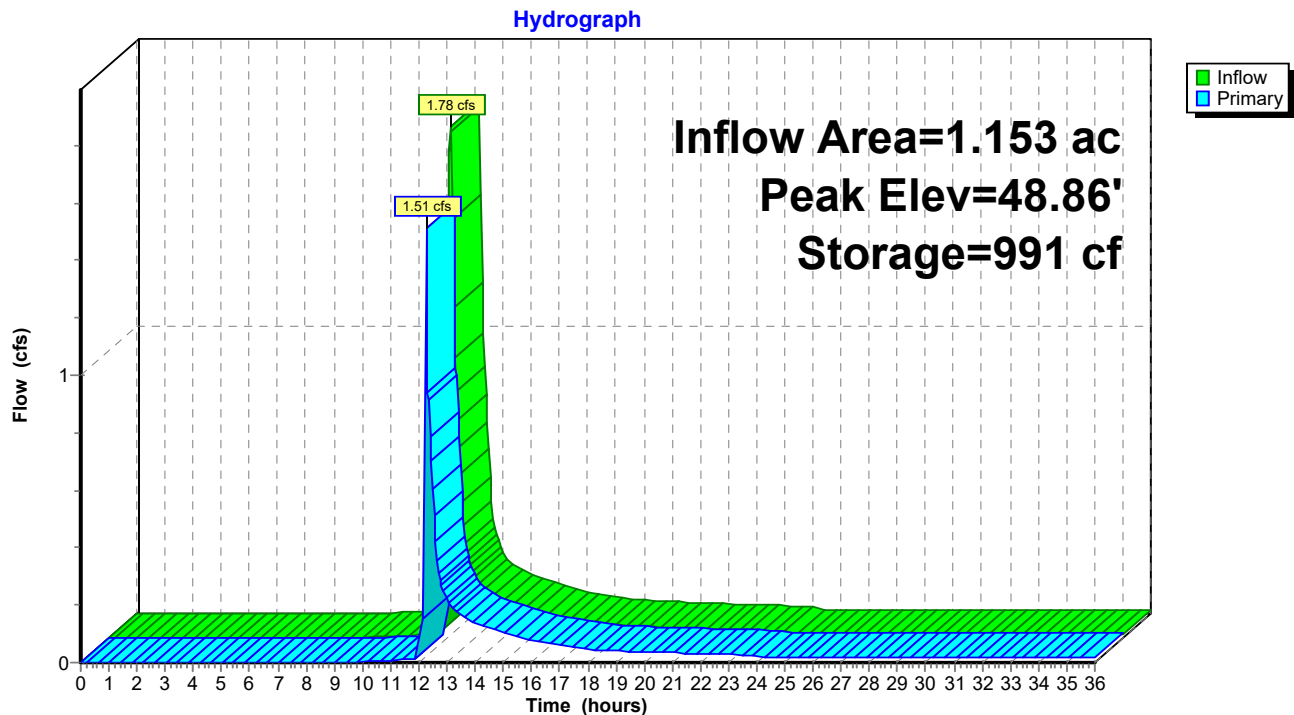
Primary OutFlow Max=1.43 cfs @ 12.26 hrs HW=48.86' TW=0.00' (Dynamic Tailwater)

3=Culvert (Passes 1.43 cfs of 6.97 cfs potential flow)

1=Exfiltration (Exfiltration Controls 0.02 cfs)

2=Orifice/Grate (Weir Controls 1.40 cfs @ 1.08 fps)

Pond 3P: rain garden#3 cascading



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Summary for Pond 4P: UGS-1

Inflow Area = 1.685 ac, 60.12% Impervious, Inflow Depth = 1.69" for 2 yr event
 Inflow = 3.17 cfs @ 12.09 hrs, Volume= 0.238 af
 Outflow = 1.96 cfs @ 12.22 hrs, Volume= 0.218 af, Atten= 38%, Lag= 7.6 min
 Discarded = 0.04 cfs @ 10.25 hrs, Volume= 0.094 af
 Primary = 1.92 cfs @ 12.22 hrs, Volume= 0.124 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 42.31' @ 12.22 hrs Surf.Area= 1,672 sf Storage= 3,125 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 212.8 min (1,030.7 - 817.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	39.50'	2,099 cf	29.92'W x 55.89'L x 5.50'H Field A 9,196 cf Overall - 3,198 cf Embedded = 5,998 cf x 35.0% Voids
#2A	40.25'	3,198 cf	ADS_StormTech MC-3500 d +Capx 28 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 28 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		5,297 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	39.50'	24.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 39.50' / 39.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	43.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Discarded	39.50'	1.020 in/hr Exfiltration over Surface area
#4	Device 1	41.83'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.04 cfs @ 10.25 hrs HW=39.56' (Free Discharge)↑ **3=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=1.84 cfs @ 12.22 hrs HW=42.30' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 1.84 cfs of 20.16 cfs potential flow)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)↑ **4=Orifice/Grate** (Orifice Controls 1.84 cfs @ 2.33 fps)

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Pond 4P: UGS-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)

Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf

Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap

Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length

4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width

9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

28 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 4 Rows = 3,197.9 cf Chamber Storage

9,196.2 cf Field - 3,197.9 cf Chambers = 5,998.4 cf Stone x 35.0% Voids = 2,099.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,297.3 cf = 0.122 af

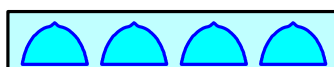
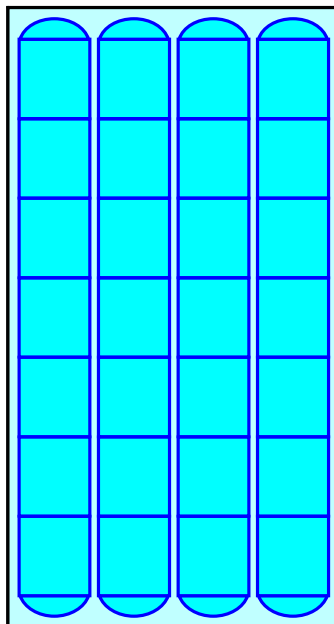
Overall Storage Efficiency = 57.6%

Overall System Size = 55.89' x 29.92' x 5.50'

28 Chambers

340.6 cy Field

222.2 cy Stone



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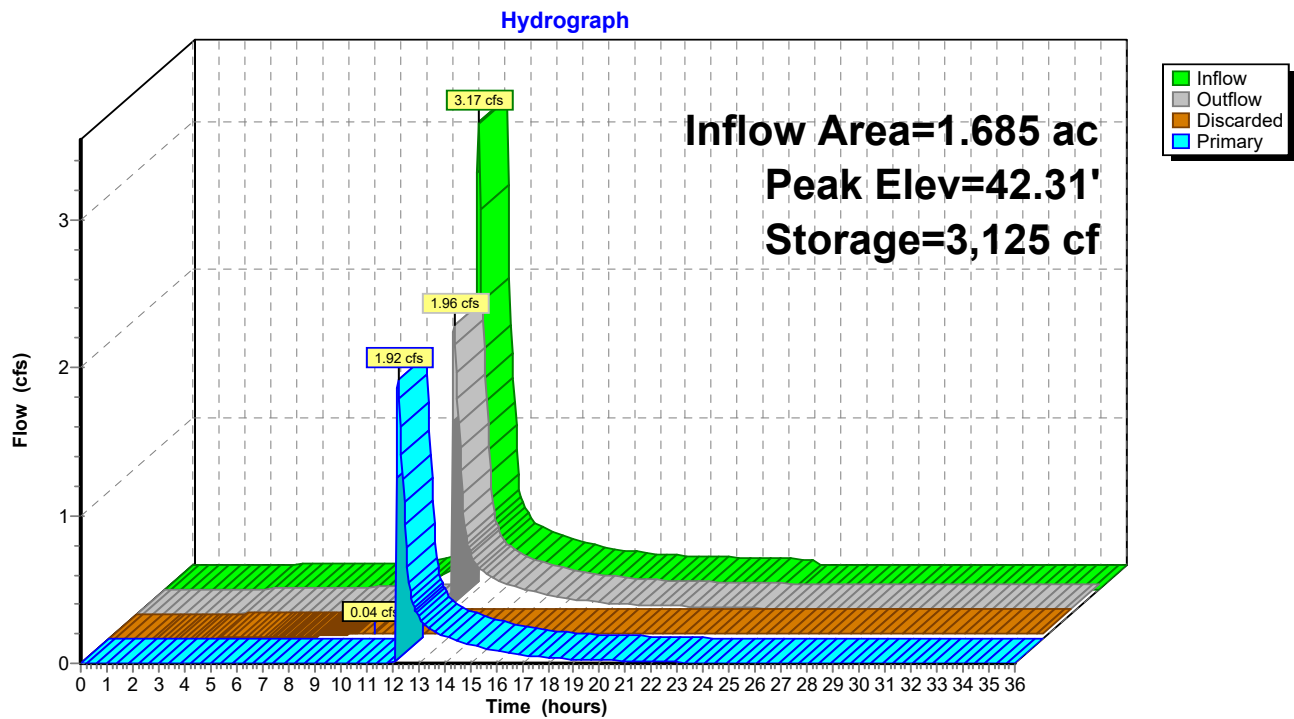
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Pond 4P: UGS-1



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Summary for Pond BB 01 B: BB 01 B

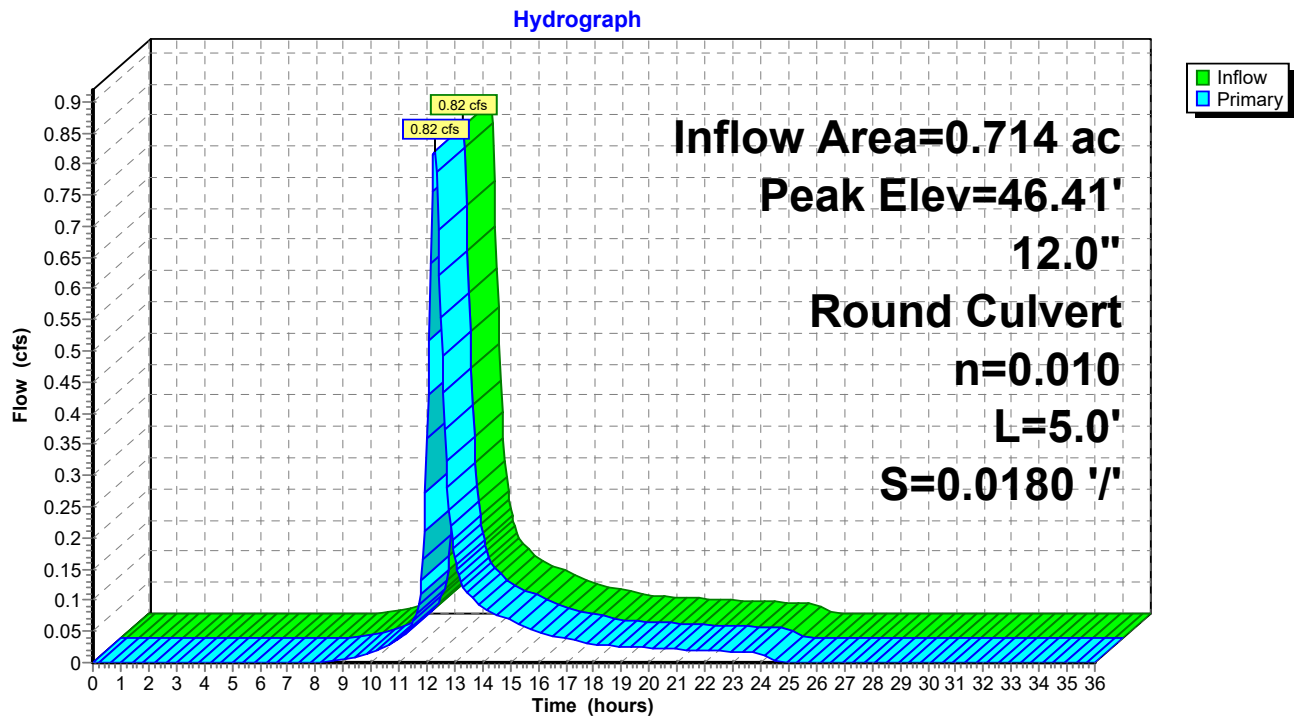
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 1.49" for 2 yr event
Inflow = 0.82 cfs @ 12.27 hrs, Volume= 0.089 af
Outflow = 0.82 cfs @ 12.27 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.27 hrs, Volume= 0.089 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.41' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	12.0" Round Culvert L= 5.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.81' S= 0.0180 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.27 hrs HW=46.41' TW=45.88' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 0.81 cfs @ 2.94 fps)

Pond BB 01 B: BB 01 B



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond BB 01 S: BB 01 S

Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 1.49" for 2 yr event
 Inflow = 0.82 cfs @ 12.27 hrs, Volume= 0.089 af
 Outflow = 0.38 cfs @ 12.64 hrs, Volume= 0.089 af, Atten= 54%, Lag= 22.3 min
 Primary = 0.38 cfs @ 12.64 hrs, Volume= 0.089 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.08' @ 12.65 hrs Surf.Area= 0 sf Storage= 717 cf

Plug-Flow detention time= 13.5 min calculated for 0.089 af (100% of inflow)
 Center-of-Mass det. time= 13.1 min (856.5 - 843.4)

Volume	Invert	Avail.Storage	Storage Description
#1	44.97'	3,256 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.97	0	0
45.30	16	16
45.80	236	252
46.30	825	1,077
46.80	876	1,953
47.30	792	2,745
47.80	511	3,256

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	4.0" Round Culvert L= 8.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 44.87' S= 0.0125 '/' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	46.40'	6.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.40' / 46.30' S= 0.0200 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf

Primary OutFlow Max=0.38 cfs @ 12.64 hrs HW=46.08' TW=45.27' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.38 cfs @ 4.33 fps)

2=Culvert (Controls 0.00 cfs)

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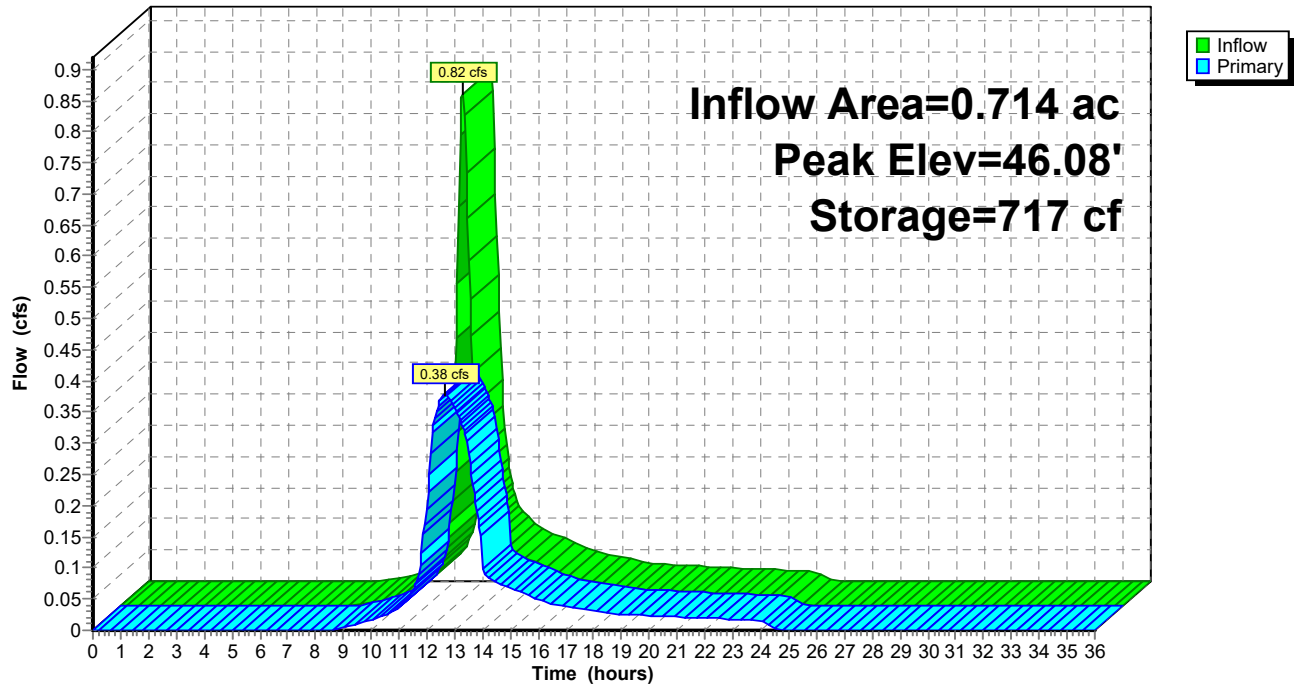
Type III 24-hr 2 yr Rainfall=3.20"

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Pond BB 01 S: BB 01 S

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond BB 06 B: BB 06 B

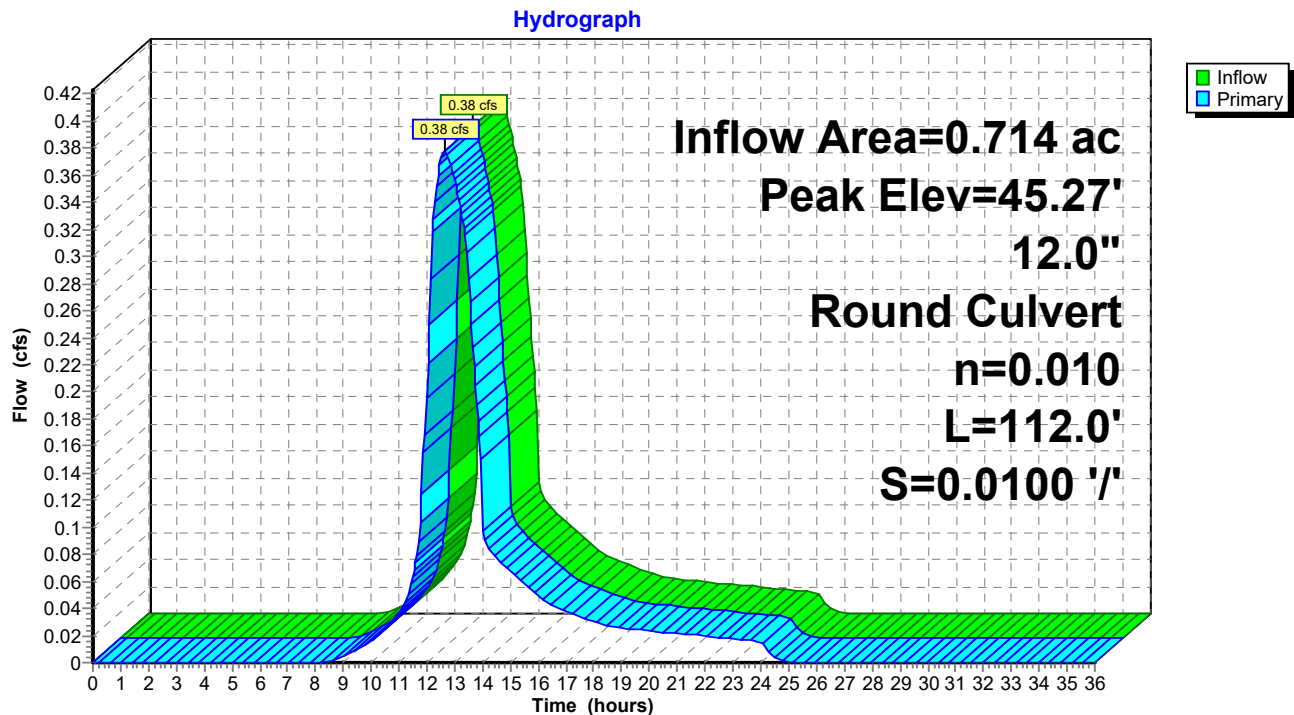
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 1.49" for 2 yr event
Inflow = 0.38 cfs @ 12.64 hrs, Volume= 0.089 af
Outflow = 0.38 cfs @ 12.64 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.64 hrs, Volume= 0.089 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 45.27' @ 12.64 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 43.85' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.38 cfs @ 12.64 hrs HW=45.27' TW=43.02' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 0.38 cfs @ 1.88 fps)

Pond BB 06 B: BB 06 B



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Summary for Pond BB 11 B: BB 11 B

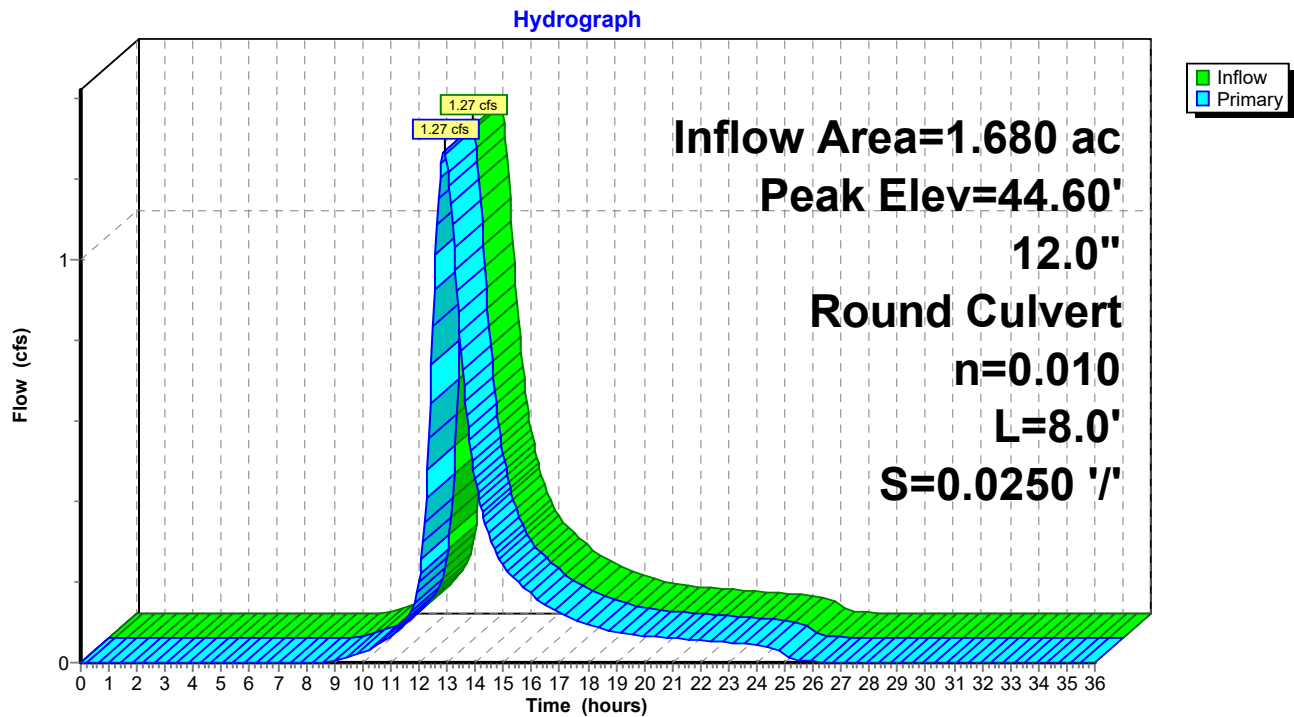
Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 1.76" for 2 yr event
Inflow = 1.27 cfs @ 12.90 hrs, Volume= 0.246 af
Outflow = 1.27 cfs @ 12.90 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.90 hrs, Volume= 0.246 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 44.60' @ 12.90 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.00'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.00' / 43.80' S= 0.0250 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.27 cfs @ 12.90 hrs HW=44.60' TW=43.67' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 1.27 cfs @ 3.69 fps)

Pond BB 11 B: BB 11 B



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond BB 11 S: BB 11 S

Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 1.76" for 2 yr event
 Inflow = 1.27 cfs @ 12.90 hrs, Volume= 0.246 af
 Outflow = 1.13 cfs @ 13.16 hrs, Volume= 0.246 af, Atten= 11%, Lag= 15.6 min
 Primary = 1.13 cfs @ 13.16 hrs, Volume= 0.246 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 43.79' @ 13.16 hrs Surf.Area= 0 sf Storage= 489 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 2.3 min (884.8 - 882.5)

Volume	Invert	Avail.Storage	Storage Description
#1	42.97'	4,778 cf	Custom Stage Data Listed below
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
42.97	0	0	
43.30	16	16	
43.80	481	497	
44.30	963	1,460	
44.80	1,019	2,479	
45.30	1,085	3,564	
45.80	603	4,167	
46.30	611	4,778	

Device	Routing	Invert	Outlet Devices
#1	Primary	42.97'	4.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.97' / 42.81' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	39.70'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.70' / 39.60' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Primary	44.50'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.50' / 44.40' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.13 cfs @ 13.16 hrs HW=43.79' TW=43.09' (Dynamic Tailwater)

1=Culvert (Barrel Controls 0.34 cfs @ 3.87 fps)
 2=Culvert (Inlet Controls 0.79 cfs @ 4.04 fps)
 3=Culvert (Controls 0.00 cfs)

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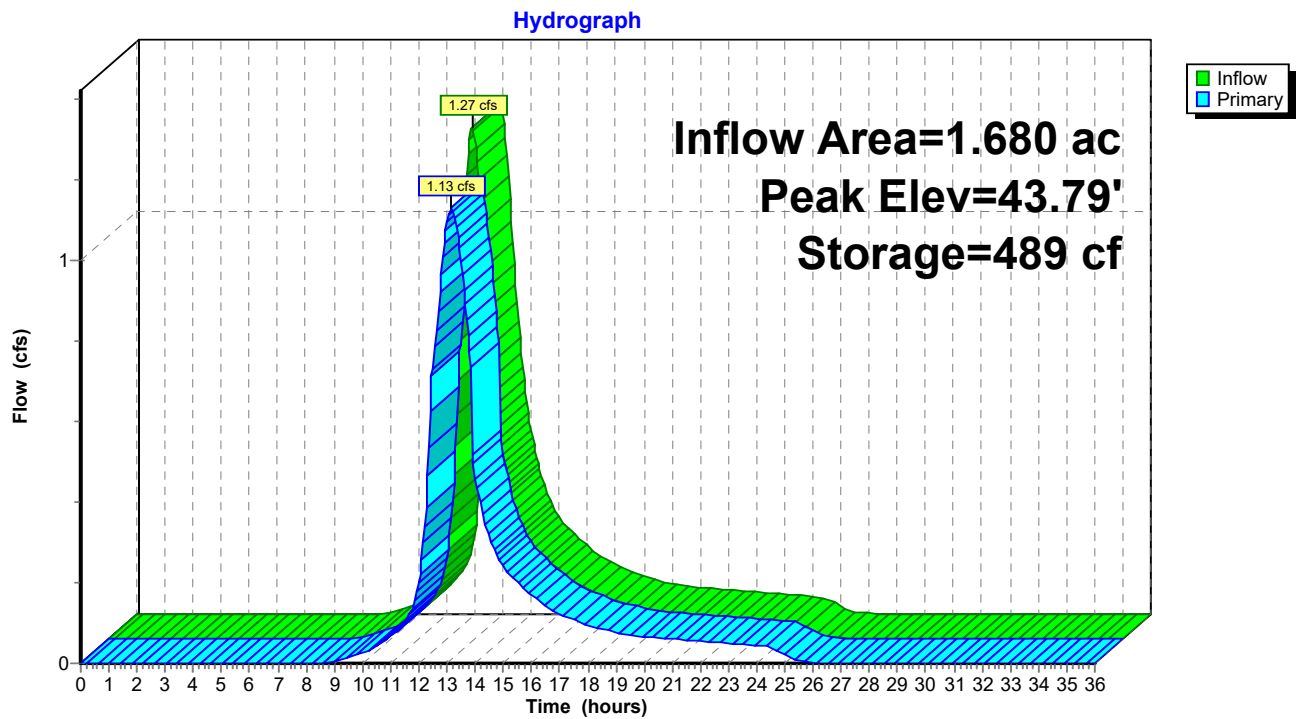
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Type III 24-hr 2 yr Rainfall=3.20"

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Pond BB 11 S: BB 11 S



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond PR-4: PR-4

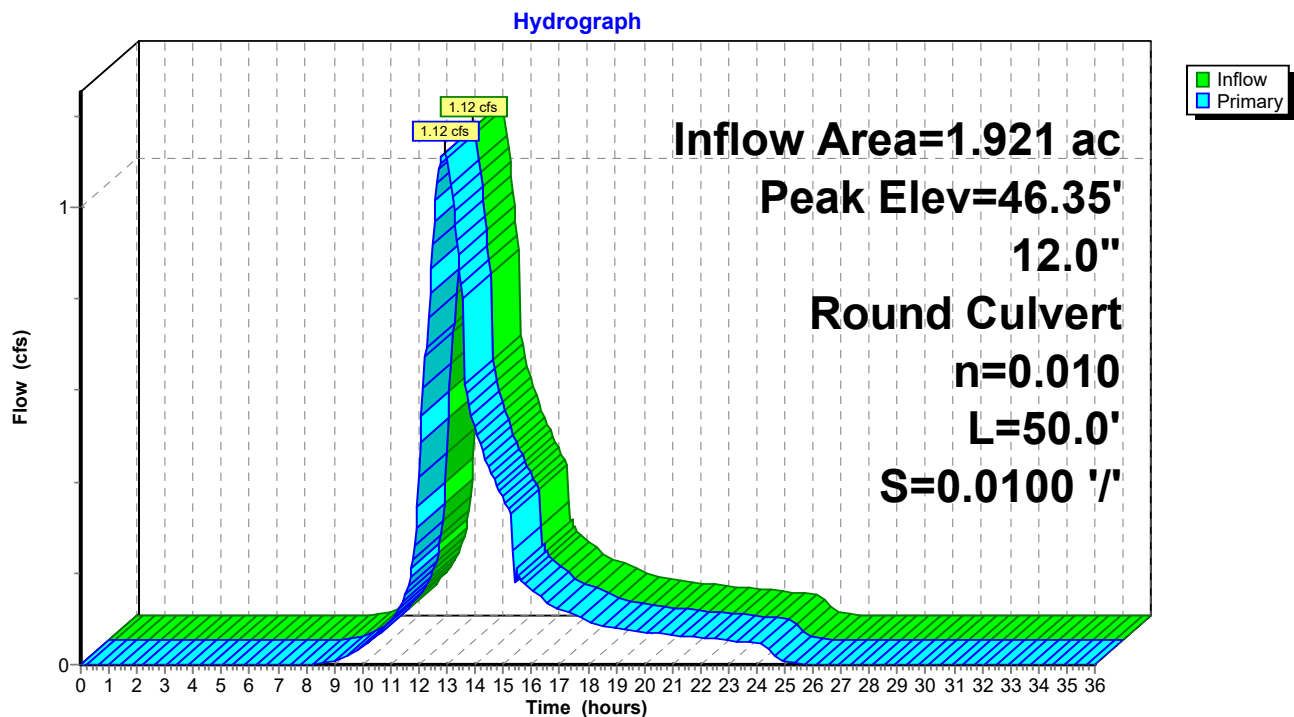
Inflow Area = 1.921 ac, 1.30% Impervious, Inflow Depth = 1.69" for 2 yr event
Inflow = 1.12 cfs @ 12.91 hrs, Volume= 0.271 af
Outflow = 1.12 cfs @ 12.91 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min
Primary = 1.12 cfs @ 12.91 hrs, Volume= 0.271 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.35' @ 12.91 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.80'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.80' / 45.30' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.12 cfs @ 12.91 hrs HW=46.35' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.12 cfs @ 2.53 fps)

Pond PR-4: PR-4



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond PR-5: PR-5

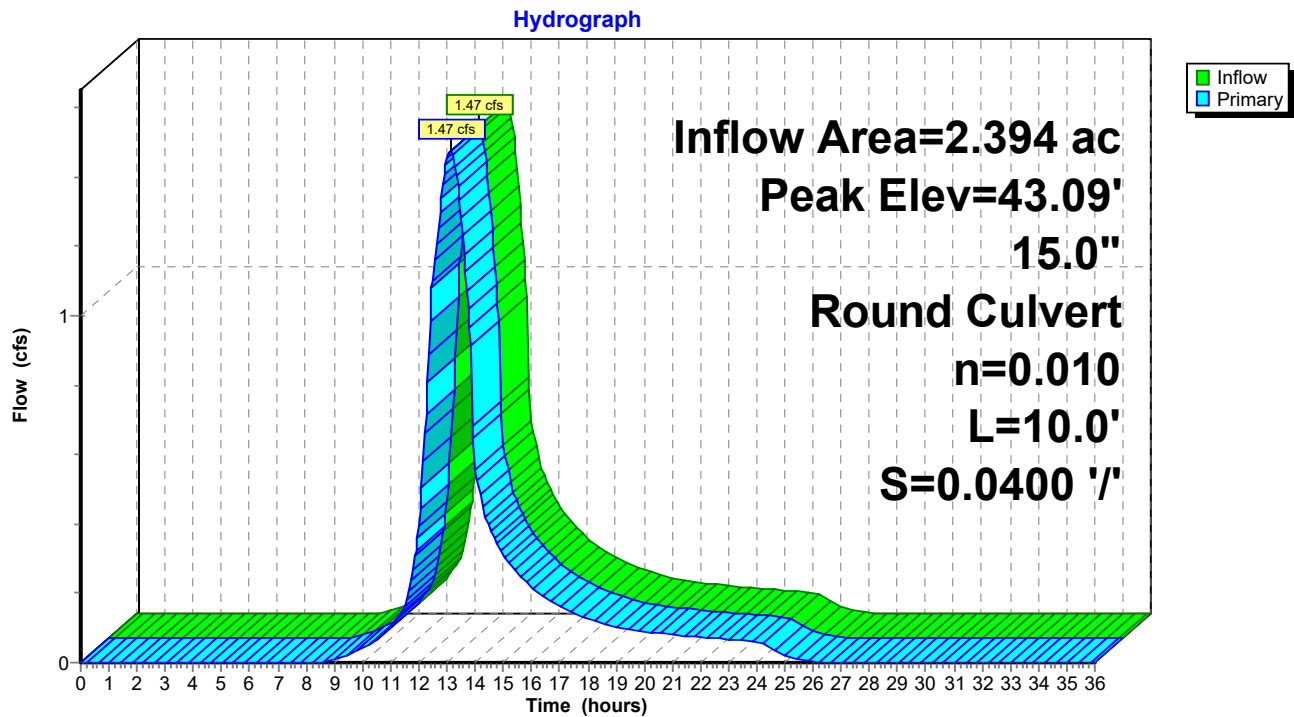
Inflow Area = 2.394 ac, 0.58% Impervious, Inflow Depth = 1.68" for 2 yr event
Inflow = 1.47 cfs @ 13.12 hrs, Volume= 0.335 af
Outflow = 1.47 cfs @ 13.12 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.0 min
Primary = 1.47 cfs @ 13.12 hrs, Volume= 0.335 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 43.09' @ 13.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.10' S= 0.0400 '/ Cc= 0.900 n= 0.010, Flow Area= 1.23 sf

Primary OutFlow Max=1.47 cfs @ 13.12 hrs HW=43.09' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.47 cfs @ 2.61 fps)

Pond PR-5: PR-5



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond SB 01 B: SB 01 B

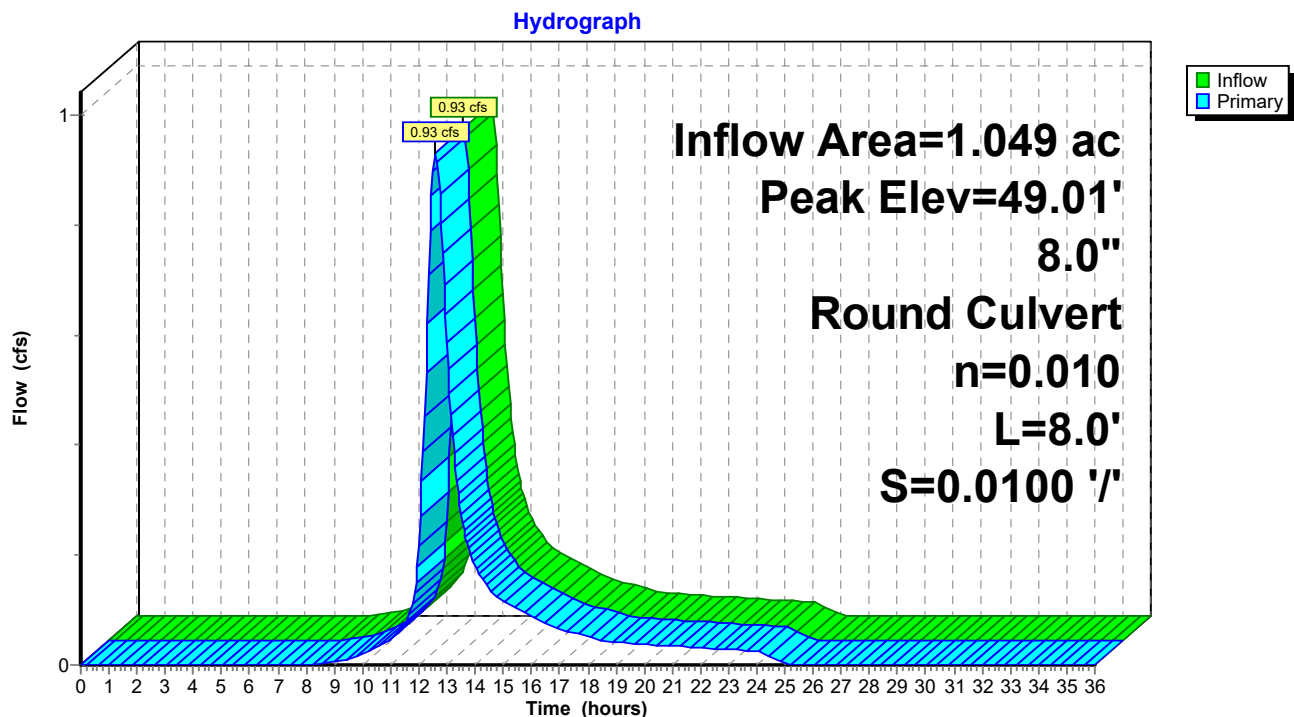
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 1.64" for 2 yr event
Inflow = 0.93 cfs @ 12.59 hrs, Volume= 0.143 af
Outflow = 0.93 cfs @ 12.59 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.59 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 49.01' @ 12.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.93 cfs @ 12.59 hrs HW=49.01' TW=47.19' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 0.93 cfs @ 3.12 fps)

Pond SB 01 B: SB 01 B



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond SB 01 S: SB 01 S

Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 1.64" for 2 yr event
 Inflow = 0.93 cfs @ 12.59 hrs, Volume= 0.143 af
 Outflow = 0.74 cfs @ 12.85 hrs, Volume= 0.143 af, Atten= 21%, Lag= 15.5 min
 Primary = 0.74 cfs @ 12.85 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.33' @ 12.86 hrs Surf.Area= 0 sf Storage= 455 cf

Plug-Flow detention time= 4.0 min calculated for 0.143 af (100% of inflow)
 Center-of-Mass det. time= 4.1 min (866.0 - 862.0)

Volume	Invert	Avail.Storage	Storage Description
#1	46.30'	4,121 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.30	0	0
46.80	16	16
47.30	386	402
47.80	837	1,239
48.30	886	2,125
48.80	943	3,068
49.30	523	3,591
49.80	530	4,121

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.30' / 46.20' S= 0.0125 '/ Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.74 cfs @ 12.85 hrs HW=47.33' TW=46.73' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.74 cfs @ 3.74 fps)

2=Culvert (Controls 0.00 cfs)

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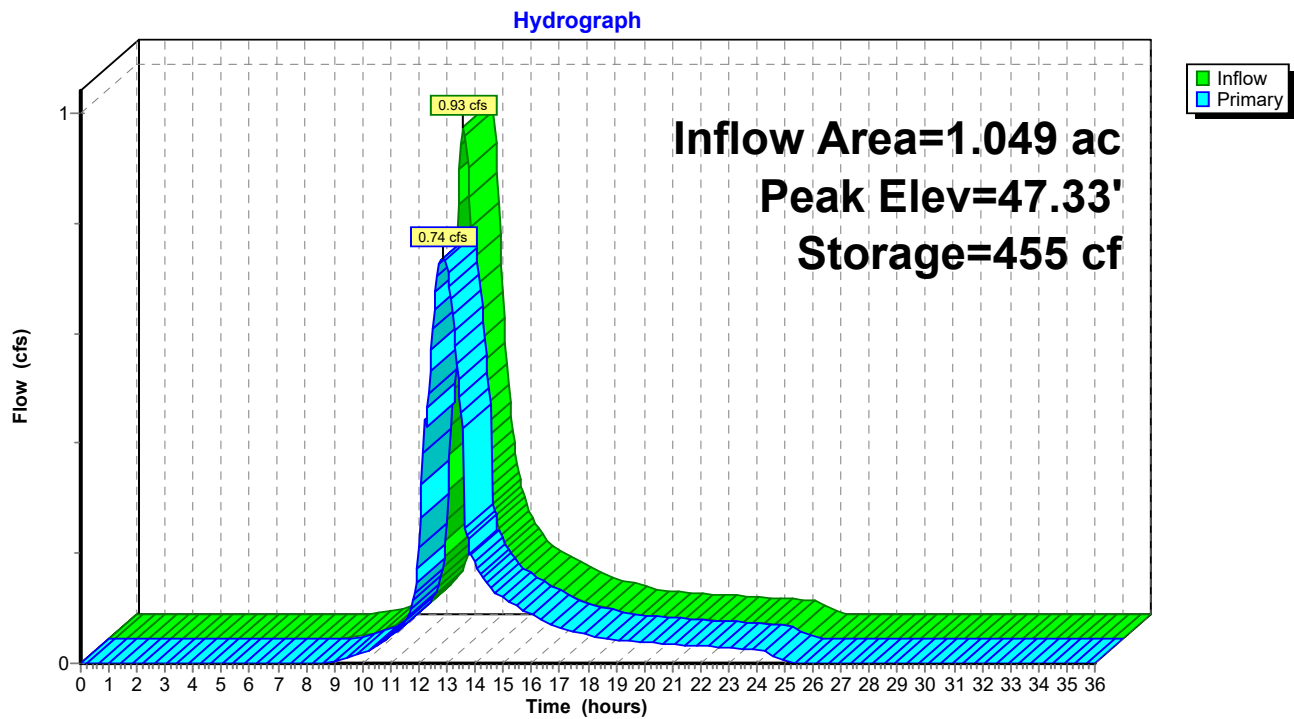
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Type III 24-hr 2 yr Rainfall=3.20"

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Pond SB 01 S: SB 01 S



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Summary for Pond SB 03 B: SB 03B

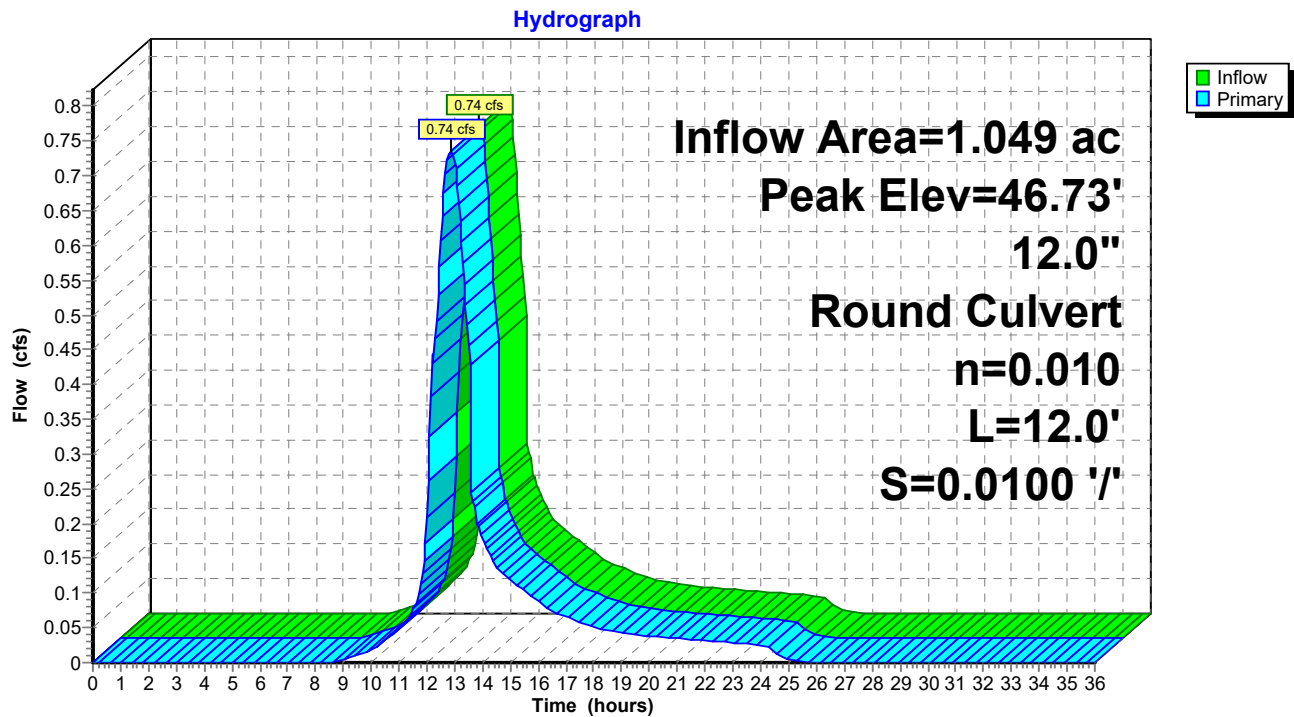
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 1.64" for 2 yr event
Inflow = 0.74 cfs @ 12.85 hrs, Volume= 0.143 af
Outflow = 0.74 cfs @ 12.85 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.85 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.73' @ 12.85 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 46.13' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.74 cfs @ 12.85 hrs HW=46.73' TW=46.35' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.74 cfs @ 2.92 fps)

Pond SB 03 B: SB 03B



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond SB 11 B: SB 11 B

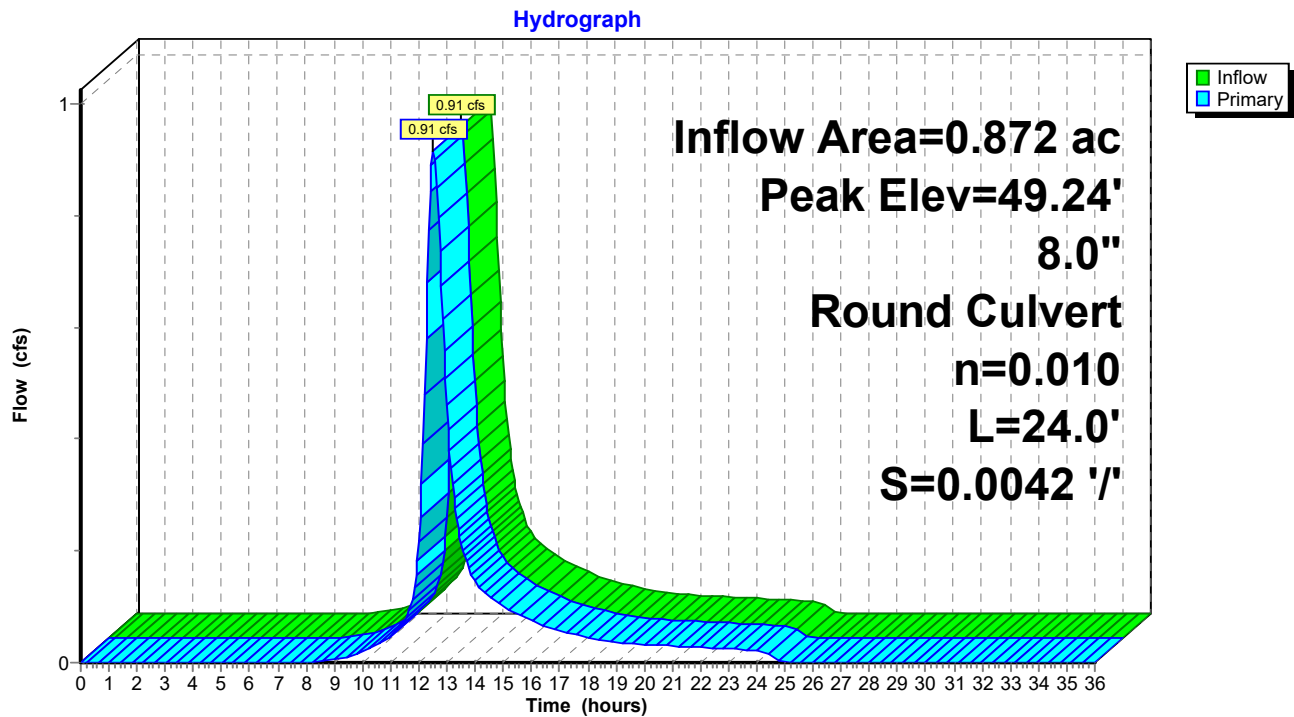
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 1.76" for 2 yr event
Inflow = 0.91 cfs @ 12.52 hrs, Volume= 0.128 af
Outflow = 0.91 cfs @ 12.52 hrs, Volume= 0.128 af, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.52 hrs, Volume= 0.128 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 49.24' @ 12.52 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	8.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.50' / 48.40' S= 0.0042 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.91 cfs @ 12.52 hrs HW=49.23' TW=47.66' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 0.91 cfs @ 2.96 fps)

Pond SB 11 B: SB 11 B



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond SB 11 S: SB 11 S

Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 1.76" for 2 yr event
 Inflow = 0.91 cfs @ 12.52 hrs, Volume= 0.128 af
 Outflow = 0.39 cfs @ 13.09 hrs, Volume= 0.128 af, Atten= 57%, Lag= 34.0 min
 Primary = 0.39 cfs @ 13.09 hrs, Volume= 0.128 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.99' @ 13.09 hrs Surf.Area= 0 sf Storage= 1,263 cf

Plug-Flow detention time= 24.8 min calculated for 0.128 af (100% of inflow)
 Center-of-Mass det. time= 24.4 min (879.6 - 855.2)

Volume	Invert	Avail.Storage	Storage Description
#1	46.80'	3,953 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.80	0	0
47.30	16	16
47.80	888	904
48.30	944	1,848
48.80	1,001	2,849
49.30	544	3,393
49.80	560	3,953

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	4.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 46.72' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	48.10'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.10' / 48.00' S= 0.0125 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.39 cfs @ 13.09 hrs HW=47.99' TW=47.13' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.39 cfs @ 4.47 fps)

2=Culvert (Controls 0.00 cfs)

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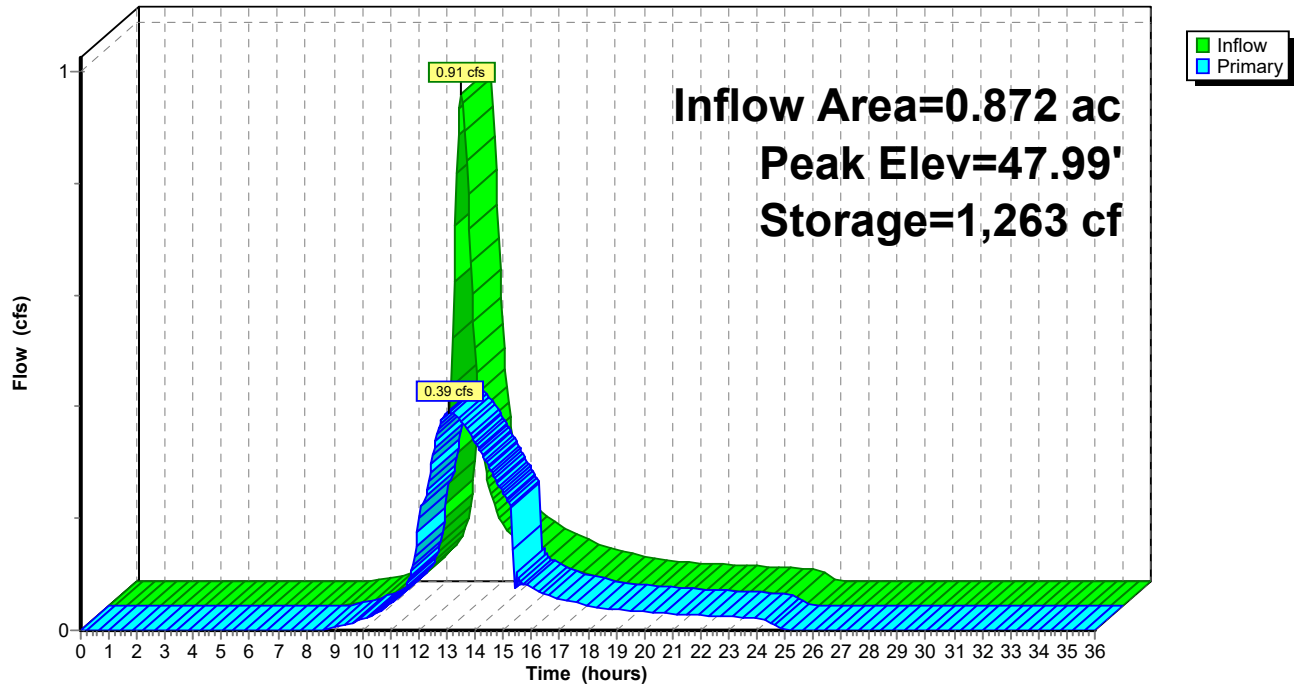
Type III 24-hr 2 yr Rainfall=3.20"

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Pond SB 11 S: SB 11 S

Hydrograph



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Type III 24-hr 2 yr Rainfall=3.20"

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Summary for Pond SB 12 B: SB 12 B

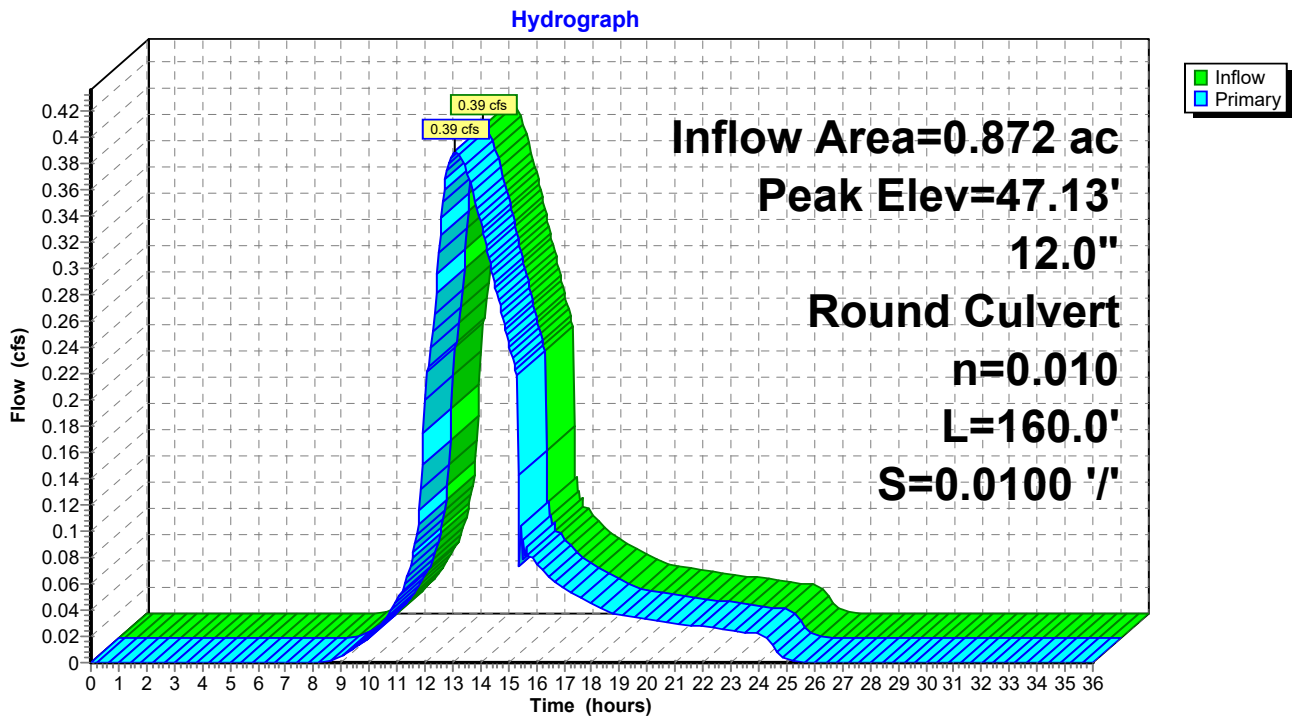
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 1.76" for 2 yr event
Inflow = 0.39 cfs @ 13.09 hrs, Volume= 0.128 af
Outflow = 0.39 cfs @ 13.09 hrs, Volume= 0.128 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 13.09 hrs, Volume= 0.128 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.13' @ 13.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	12.0" Round Culvert L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 45.20' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 13.09 hrs HW=47.13' TW=46.34' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 0.39 cfs @ 2.58 fps)

Pond SB 12 B: SB 12 B



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Type III 24-hr 2 yr Rainfall=3.20"

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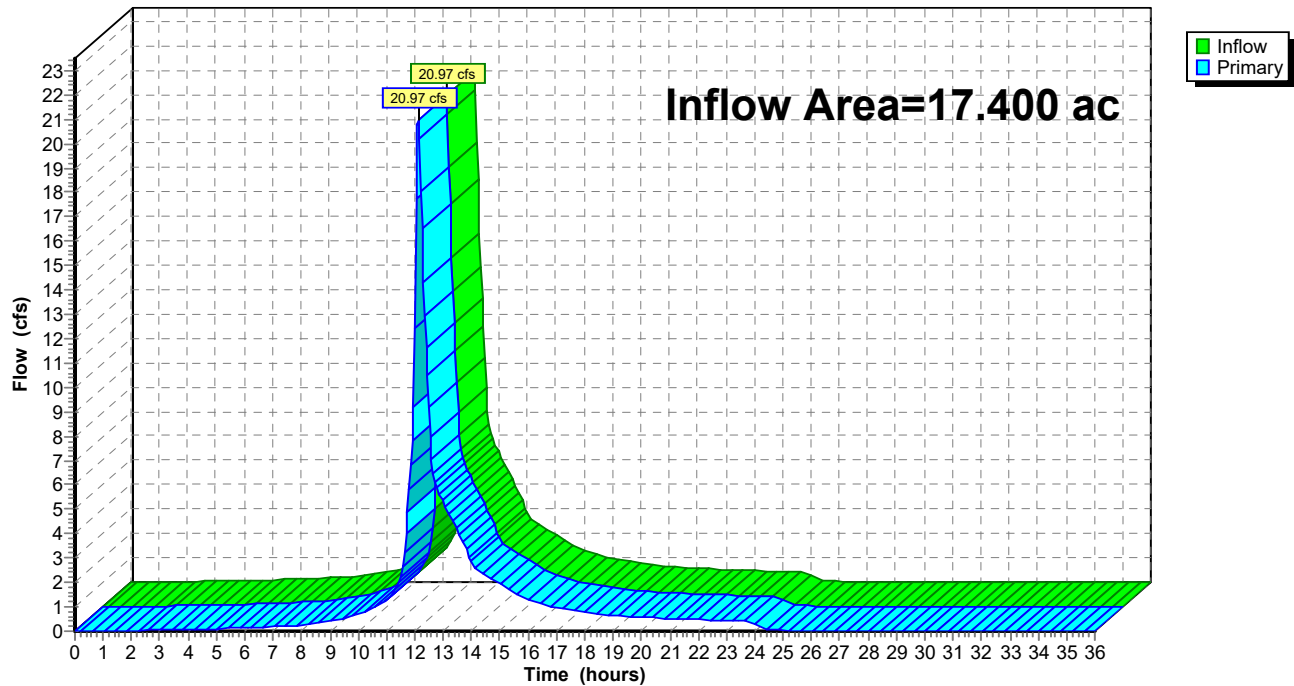
Summary for Link POA: POA

Inflow Area = 17.400 ac, 49.60% Impervious, Inflow Depth > 1.73" for 2 yr event
Inflow = 20.97 cfs @ 12.12 hrs, Volume= 2.510 af
Primary = 20.97 cfs @ 12.12 hrs, Volume= 2.510 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link POA: POA

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-1: PR-1

Runoff = 12.00 cfs @ 12.13 hrs, Volume= 0.967 af, Depth= 2.64"

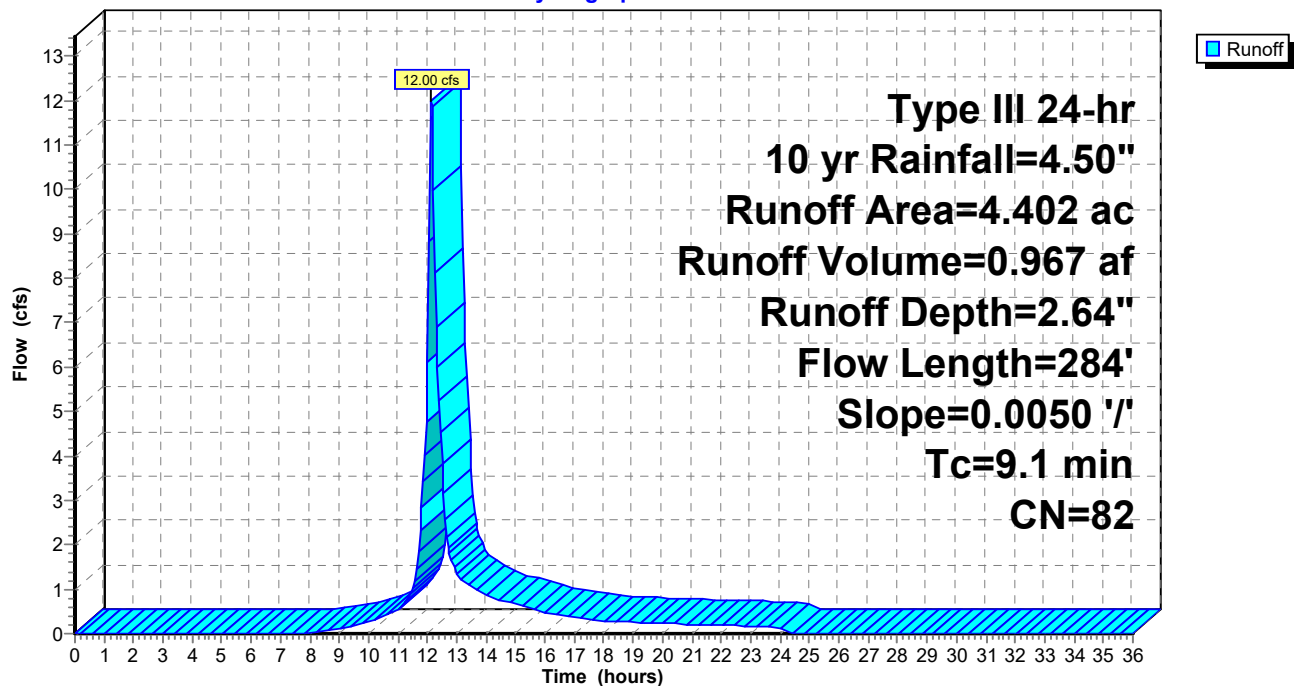
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
1.892	61	>75% Grass cover, Good, HSG B
2.510	98	Paved parking, HSG B
4.402	82	Weighted Average
1.892		42.98% Pervious Area
2.510		57.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.69		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.20"
7.9	234	0.0050	0.49		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
9.1	284	Total			

Subcatchment PR-1: PR-1

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-1A: PR-1A

Runoff = 1.84 cfs @ 12.09 hrs, Volume= 0.139 af, Depth= 3.50"

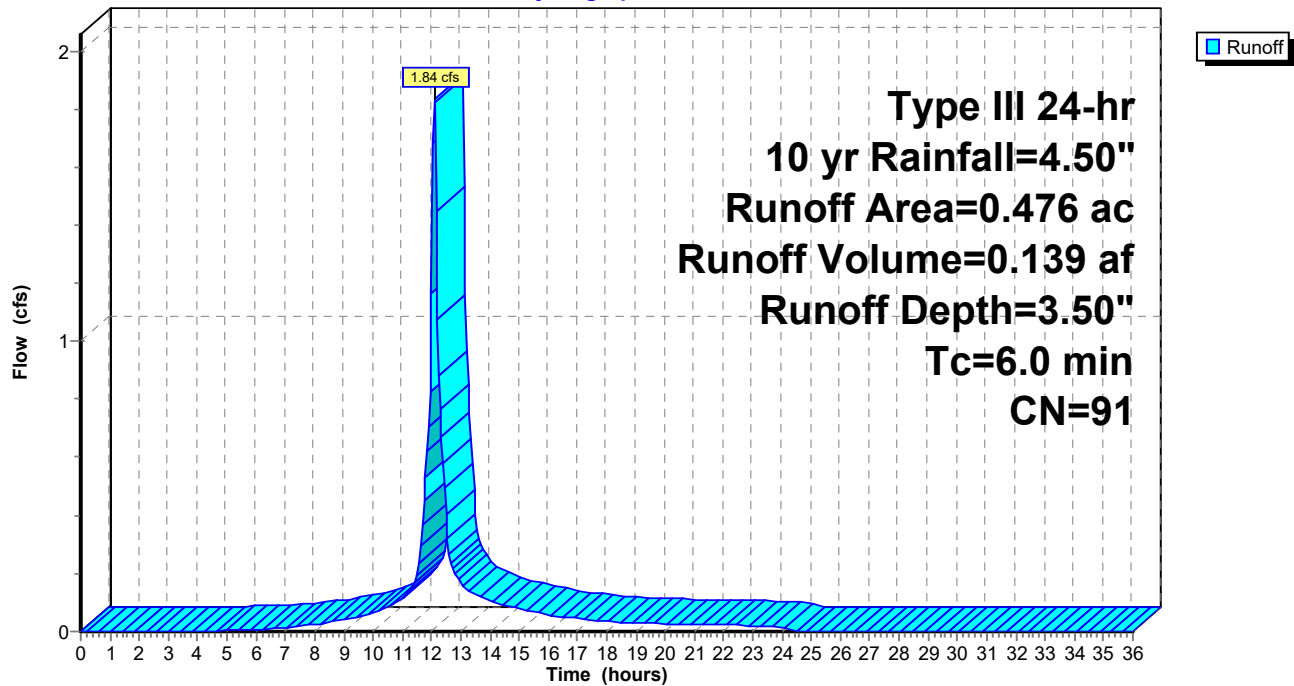
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.090	61	>75% Grass cover, Good, HSG B
0.386	98	Paved parking, HSG B
0.476	91	Weighted Average
0.090		18.91% Pervious Area
0.386		81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1A: PR-1A

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-1B: PR-1B

Runoff = 8.05 cfs @ 12.09 hrs, Volume= 0.666 af, Depth= 4.26"

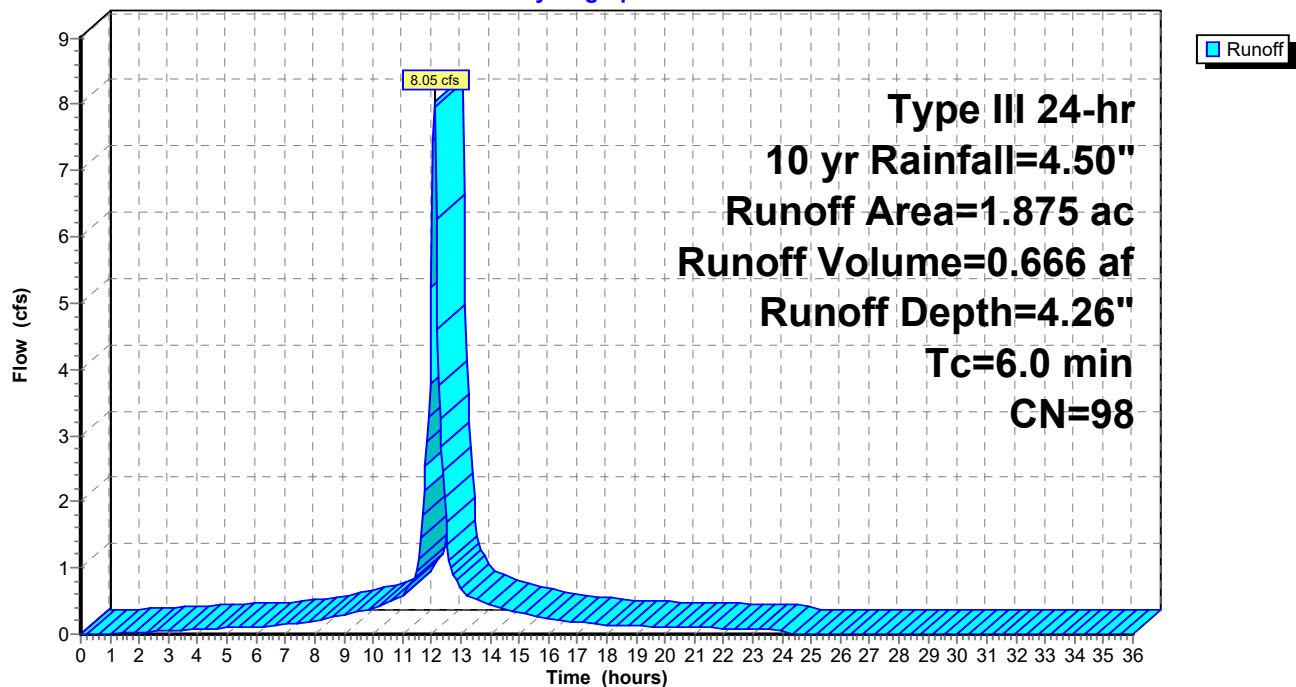
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
1.875	98	Roofs, HSG B
1.875		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1B: PR-1B

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-1C: PR-1C

Runoff = 1.08 cfs @ 12.10 hrs, Volume= 0.079 af, Depth= 2.05"

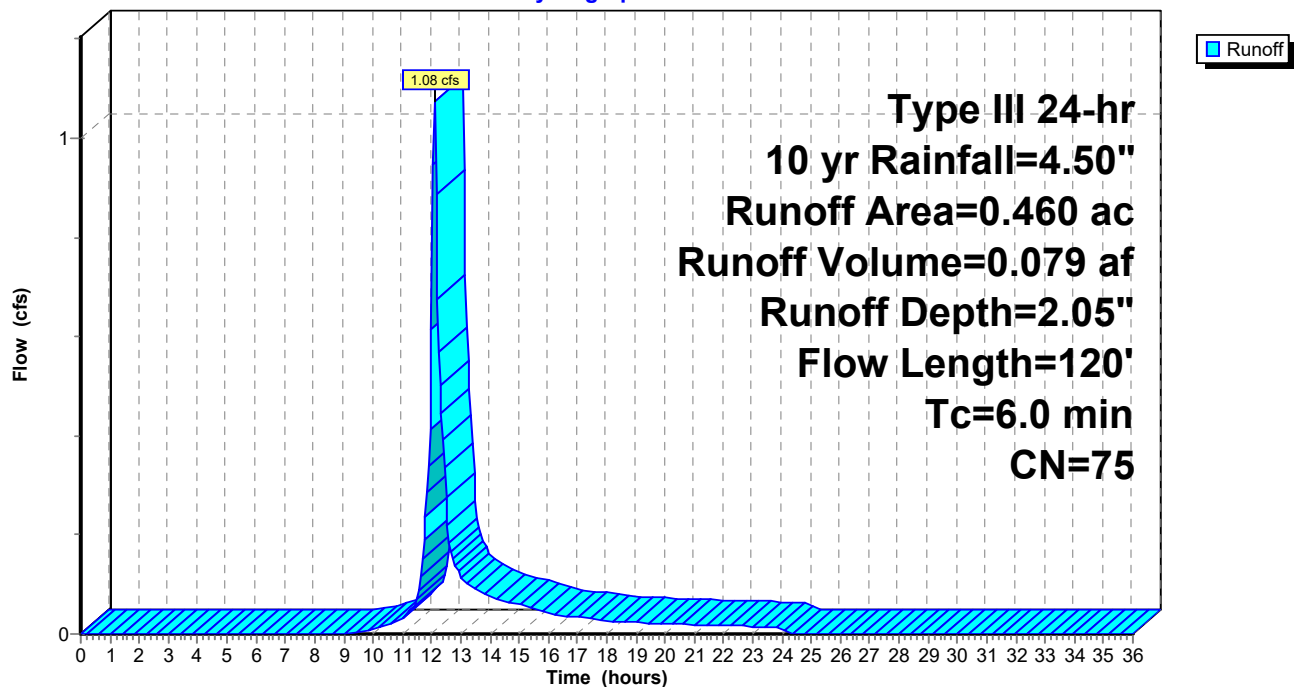
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.020	55	Woods, Good, HSG B
0.260	61	>75% Grass cover, Good, HSG B
0.180	98	Paved parking, HSG B
0.460	75	Weighted Average
0.280		60.87% Pervious Area
0.180		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	20	0.0700	0.09		Sheet Flow, 20' SF Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	40	0.5000	0.35		Sheet Flow, 30' SF Grass: Dense n= 0.240 P2= 3.20"
0.1	12	0.0100	1.61		Shallow Concentrated Flow, 12' SCF Unpaved Kv= 16.1 fps
0.2	48	0.0400	4.06		Shallow Concentrated Flow, 48' SCF Paved Kv= 20.3 fps
5.8	120	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-1C: PR-1C

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-1D: PR-1D

Runoff = 6.44 cfs @ 12.09 hrs, Volume= 0.533 af, Depth= 4.26"

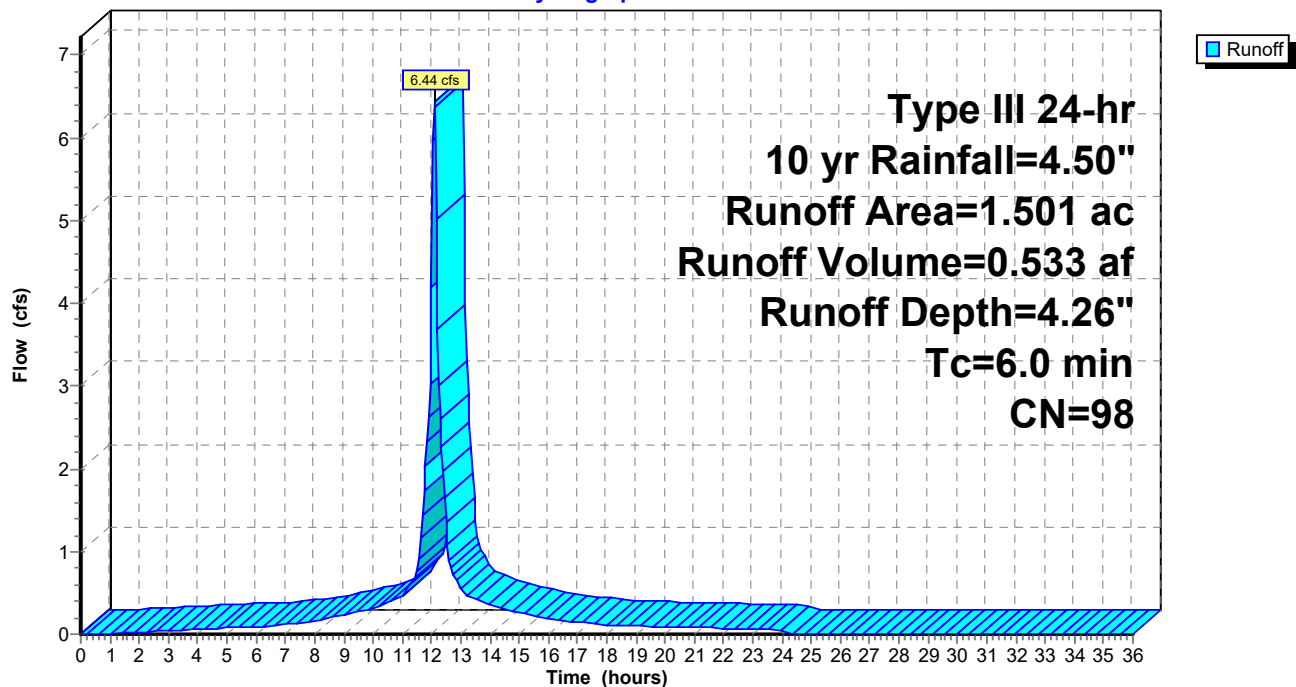
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
1.501	98	Roofs, HSG B
1.501		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1D: PR-1D

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-1E: PR-1E

Runoff = 2.81 cfs @ 12.18 hrs, Volume= 0.252 af, Depth= 1.97"

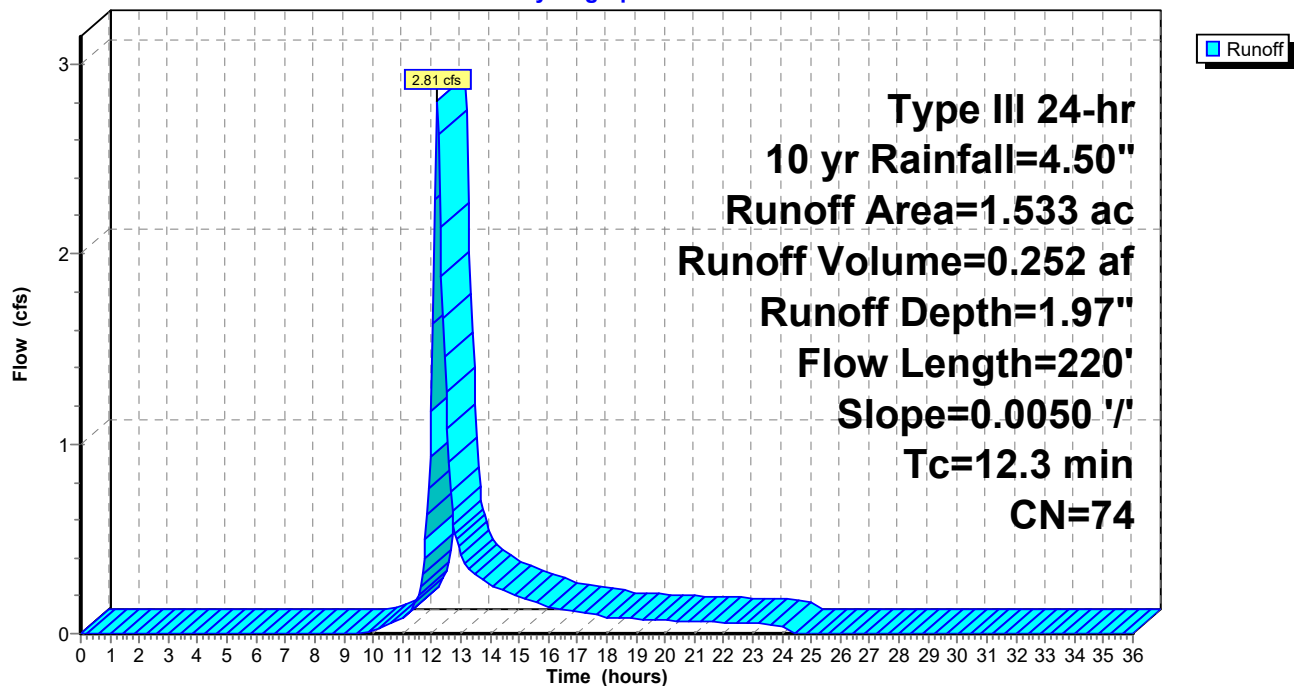
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
1.000	61	>75% Grass cover, Good, HSG B
0.533	98	Paved parking, HSG B
1.533	74	Weighted Average
1.000		65.23% Pervious Area
0.533		34.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	50	0.0050	0.09		Sheet Flow, 50' SF
					Grass: Short n= 0.150 P2= 3.20"
2.5	170	0.0050	1.14		Shallow Concentrated Flow, 170' SCF
					Unpaved Kv= 16.1 fps
12.3	220	Total			

Subcatchment PR-1E: PR-1E

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-2: PR-2

Runoff = 4.20 cfs @ 12.09 hrs, Volume= 0.304 af, Depth= 2.55"

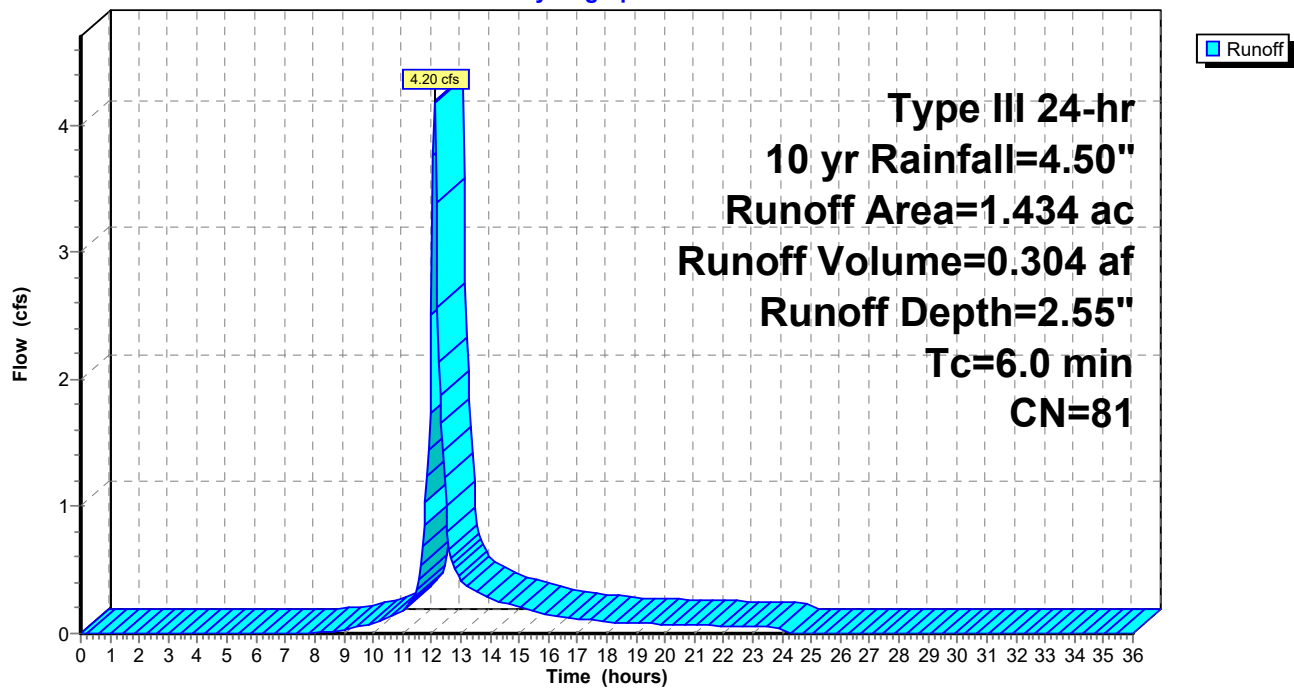
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.672	61	>75% Grass cover, Good, HSG B
0.762	98	Paved parking, HSG B
1.434	81	Weighted Average
0.672		46.86% Pervious Area
0.762		53.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: PR-2

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-2A: PR-2B

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 0.089 af, Depth= 4.26"

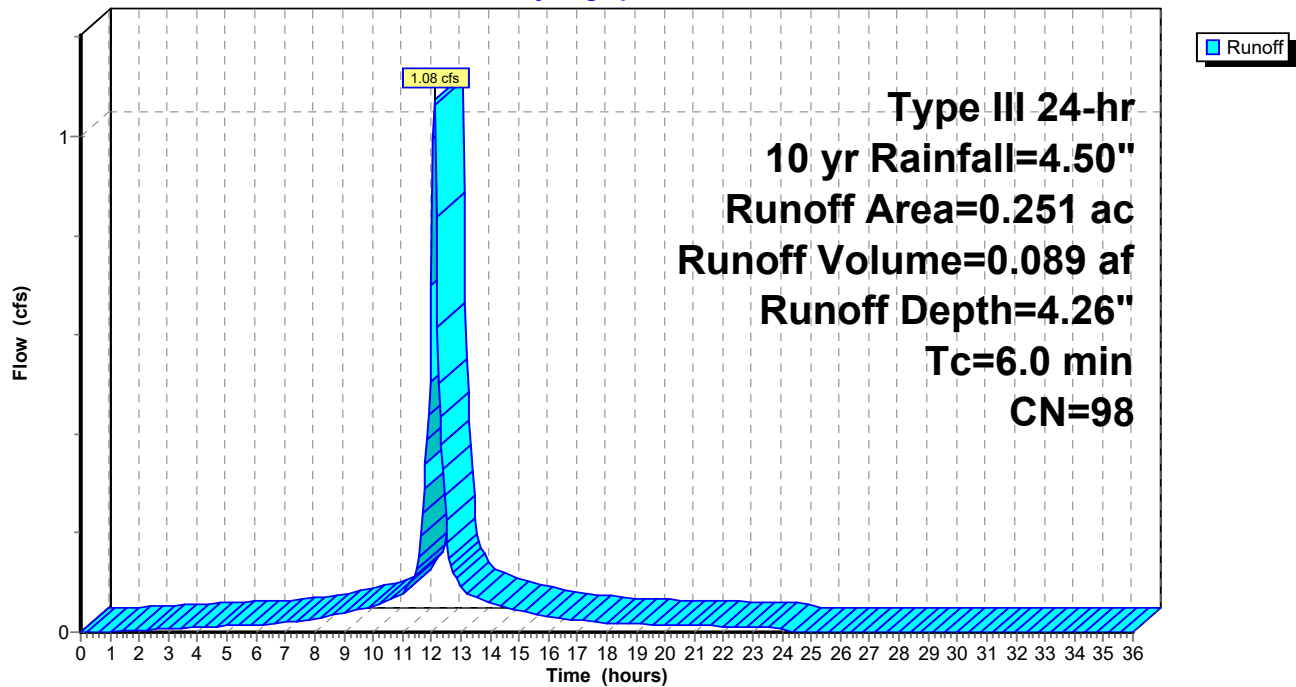
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.251	98	Roofs, HSG B
0.251		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2A: PR-2B

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 10 yr Rainfall=4.50"

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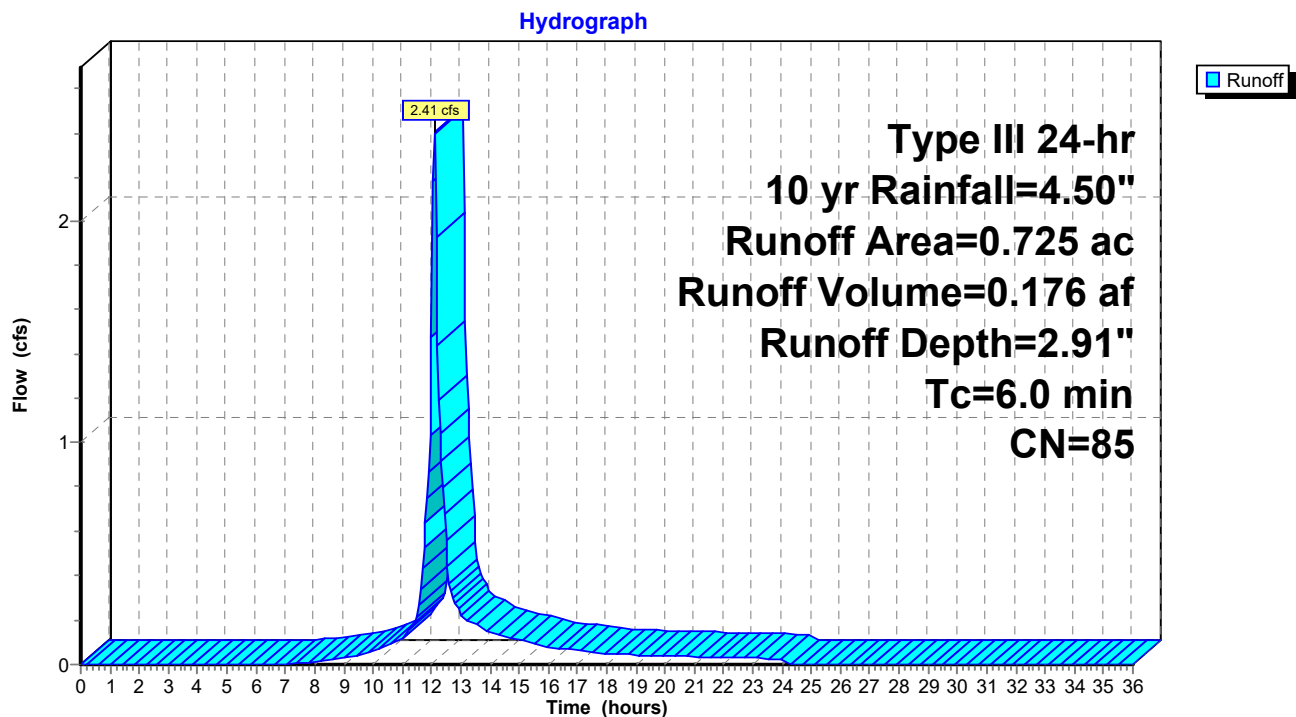
Summary for Subcatchment PR-3A: PR-3A

Runoff = 2.41 cfs @ 12.09 hrs, Volume= 0.176 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.249	61	>75% Grass cover, Good, HSG B
0.476	98	Paved parking, HSG B
0.725	85	Weighted Average
0.249		34.34% Pervious Area
0.476		65.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3A: PR-3A

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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-3B: PR-3B

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.048 af, Depth= 2.38"

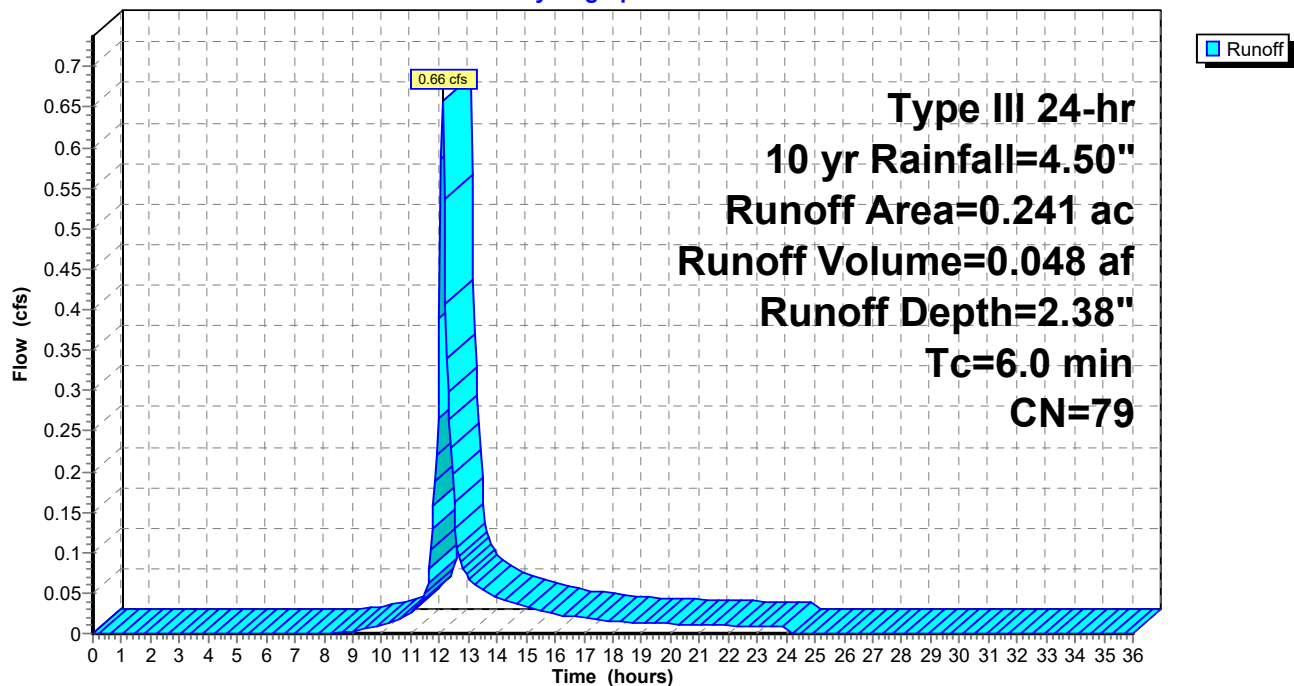
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.124	61	>75% Grass cover, Good, HSG B
0.117	98	Paved parking, HSG B
0.241	79	Weighted Average
0.124		51.45% Pervious Area
0.117		48.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3B: PR-3B

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-3C: PR-3C

Runoff = 0.20 cfs @ 12.11 hrs, Volume= 0.017 af, Depth= 1.08"

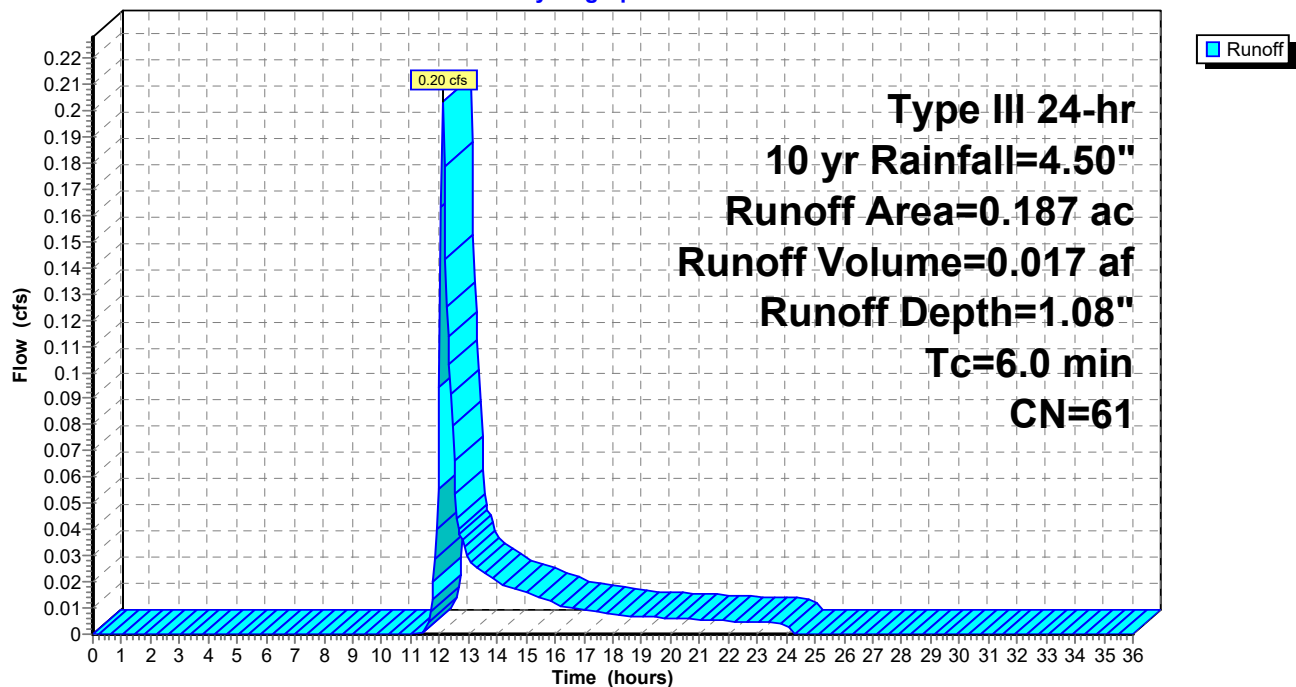
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
0.187	61	>75% Grass cover, Good, HSG B
0.187		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3C: PR-3C

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-4A: PR-5A

Runoff = 1.51 cfs @ 12.59 hrs, Volume= 0.228 af, Depth= 2.91"

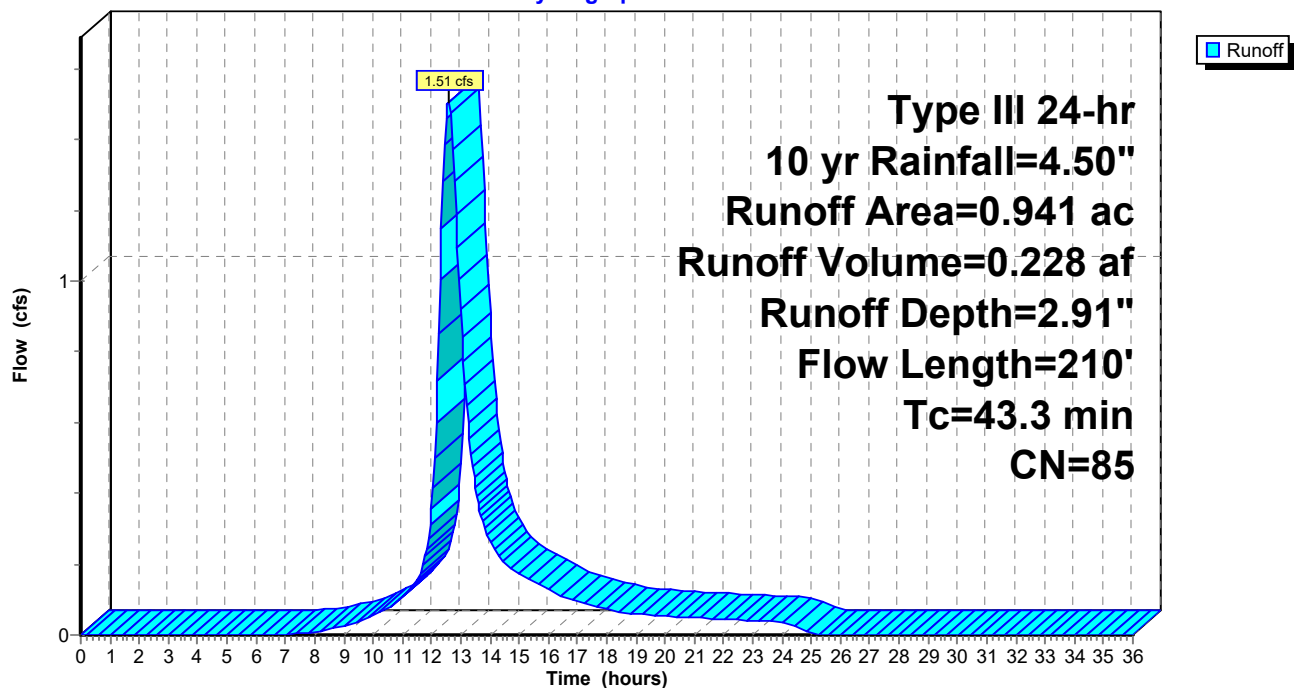
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
* 0.941	85	SYNTHETIC TURF- PAD- LINER
0.941		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	110	0.0055	0.05		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
43.3	210	Total			

Subcatchment PR-4A: PR-5A

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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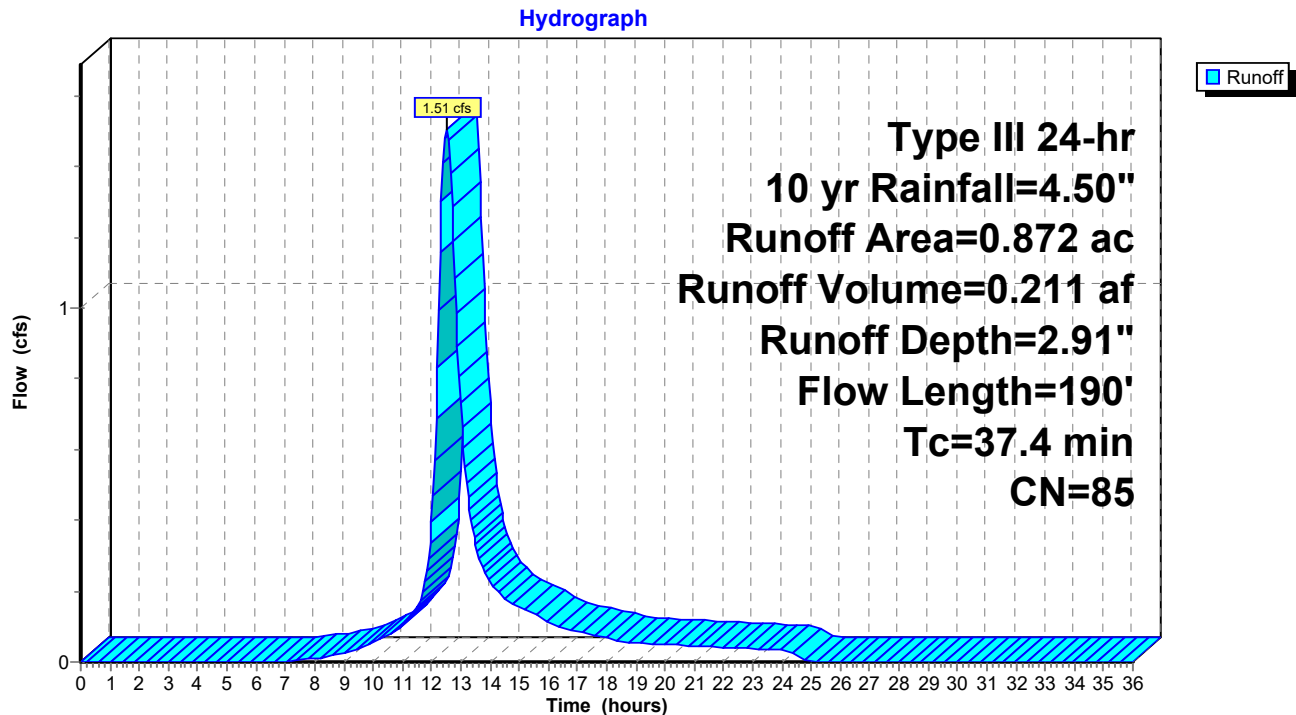
Summary for Subcatchment PR-4B: SB 11 A

Runoff = 1.51 cfs @ 12.51 hrs, Volume= 0.211 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Description
* 0.872	85	SYNTHETIC TURF- PAD- LINER
0.872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.7	90	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
37.4	190	Total			

Subcatchment PR-4B: SB 11 A

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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Subcatchment PR-4C: SB 00 DPW SLOPE

Runoff = 0.15 cfs @ 12.10 hrs, Volume= 0.012 af, Depth= 1.33"

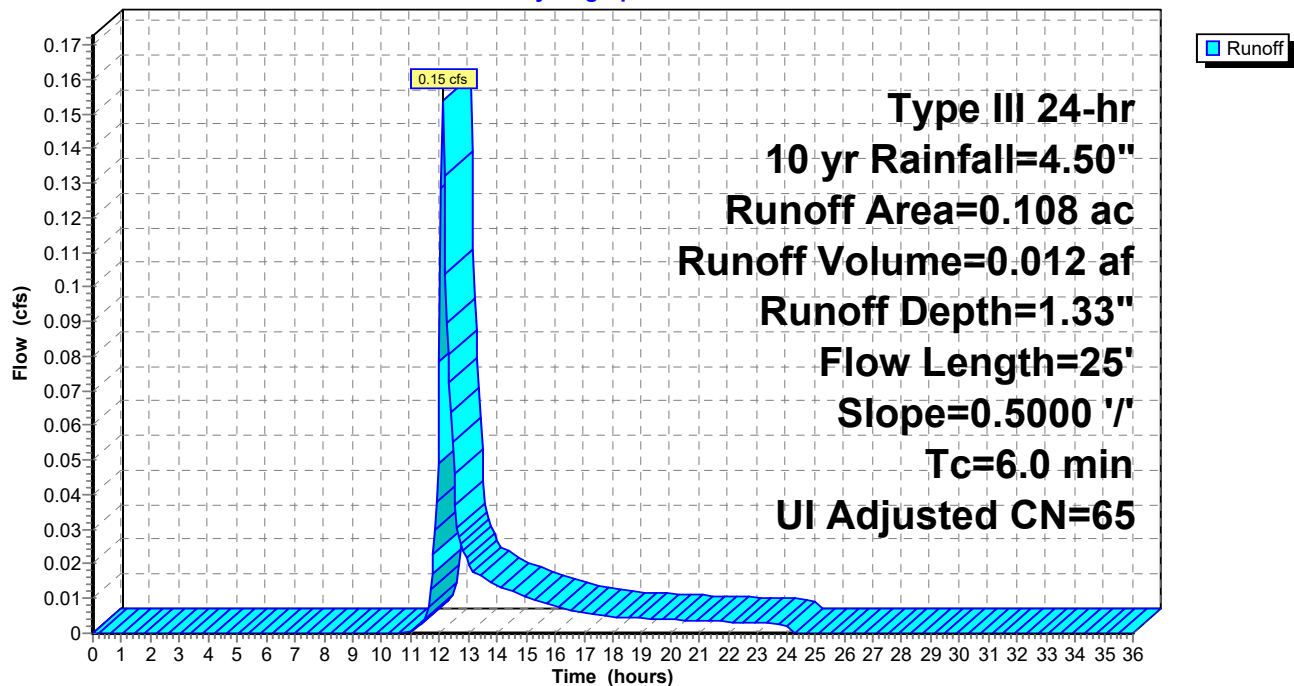
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (ac)	CN	Adj	Description
0.025	98		Unconnected pavement, HSG B
0.083	61		>75% Grass cover, Good, HSG B
0.108	70	65	Weighted Average, UI Adjusted
0.083			76.85% Pervious Area
0.025			23.15% Impervious Area
0.025			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	25	0.5000	0.32		Sheet Flow, SLOPING LAND
					Grass: Dense n= 0.240 P2= 3.20"
1.3	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-4C: SB 00 DPW SLOPE

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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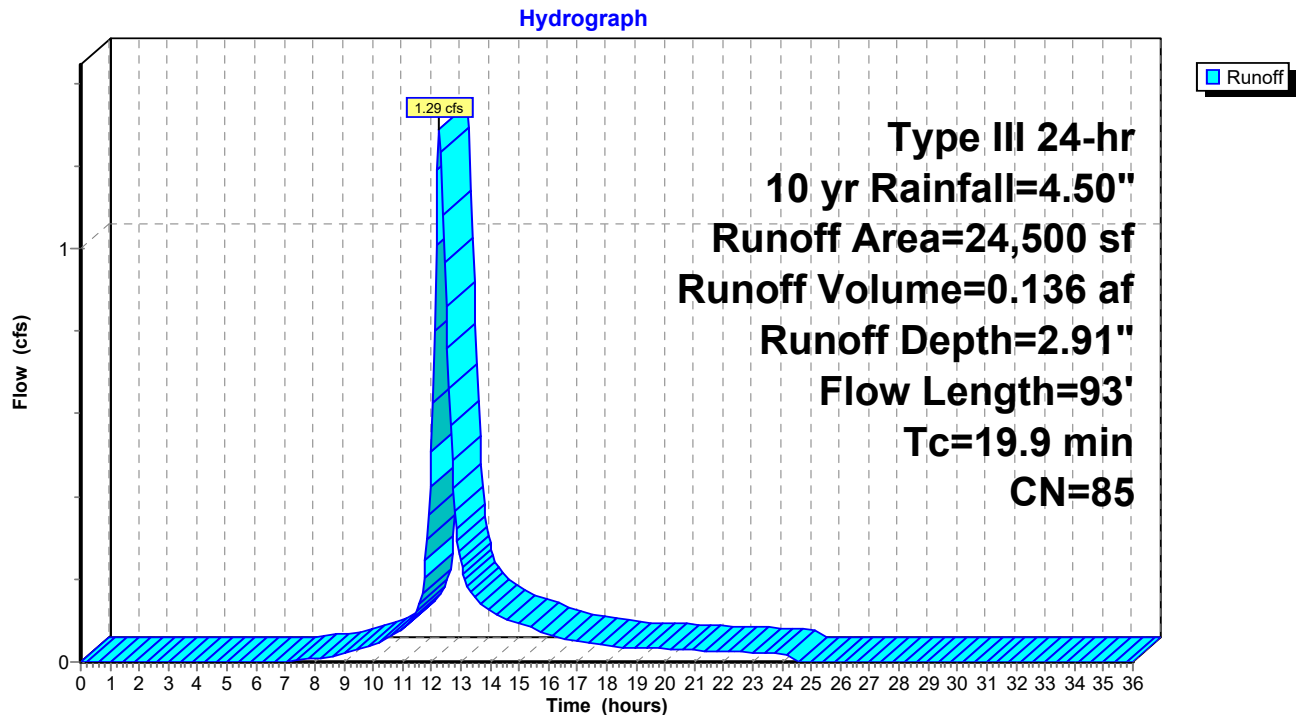
Summary for Subcatchment PR-5A: BB 01 A

Runoff = 1.29 cfs @ 12.27 hrs, Volume= 0.136 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (sf)	CN	Description
* 24,500	85	SYNTHETIC TURF- PAD- LINER
24,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	46	0.0067	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
19.9	93	Total			

Subcatchment PR-5A: BB 01 A

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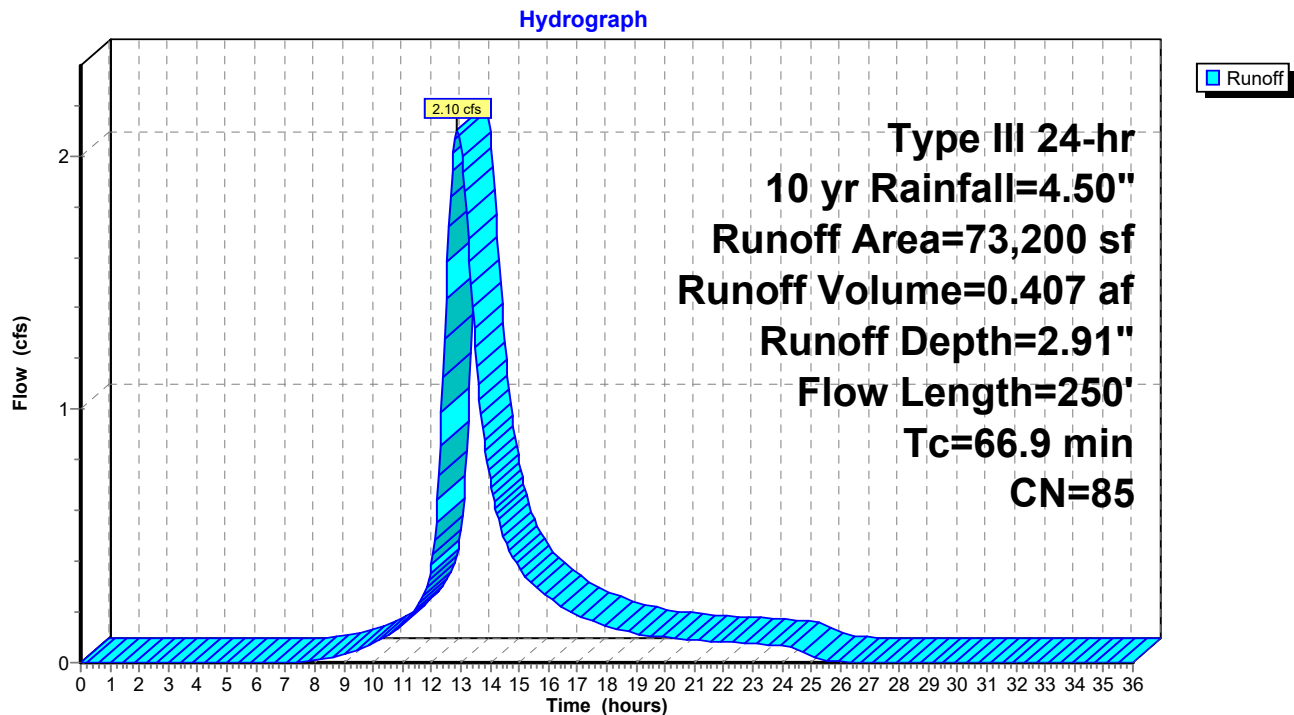
Summary for Subcatchment PR-5B: BB 11 A

Runoff = 2.10 cfs @ 12.88 hrs, Volume= 0.407 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	73,200	85	SYNTHETIC TURF- PAD- LINER
	73,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.1	53	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
43.1	150	0.0083	0.06		Sheet Flow, SYNTHETIC TURF Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
66.9	250	Total			

Subcatchment PR-5B: BB 11 A

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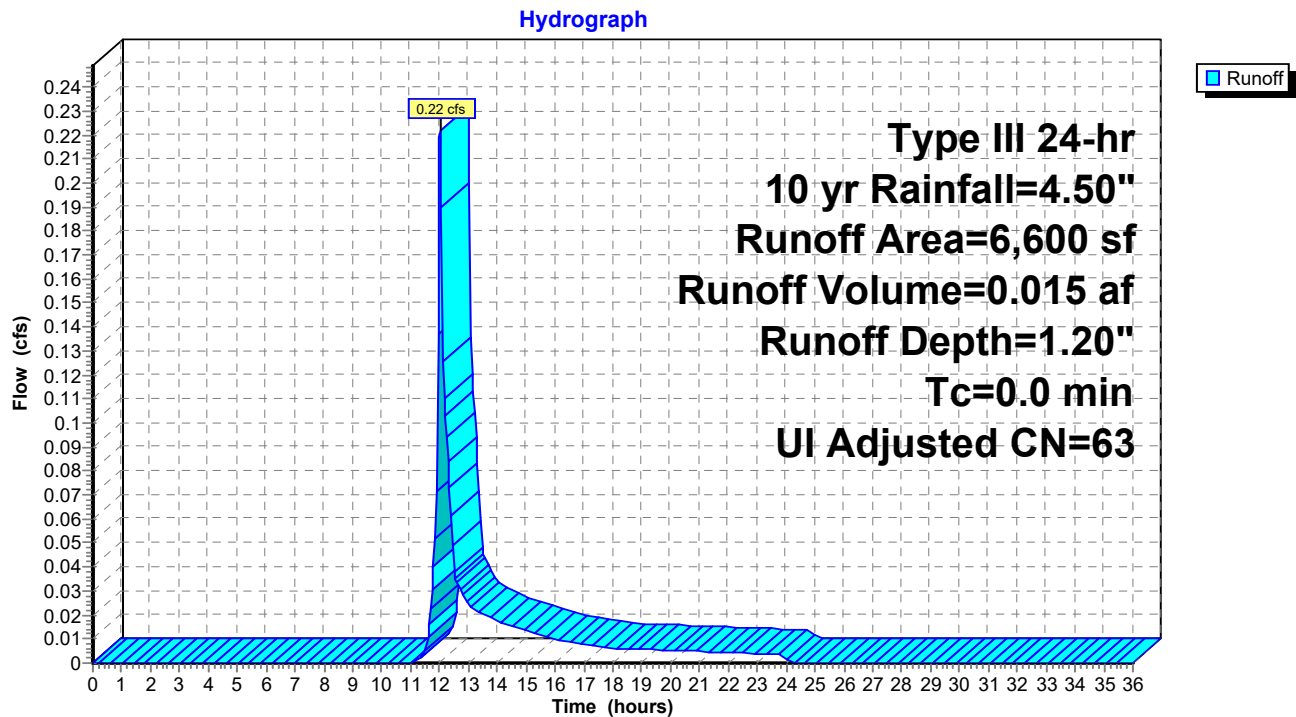
Summary for Subcatchment PR-5C: SLOPE

Runoff = 0.22 cfs @ 12.01 hrs, Volume= 0.015 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (sf)	CN	Adj	Description
600	98		Unconnected roofs, HSG B
6,000	61		>75% Grass cover, Good, HSG B
6,600	64	63	Weighted Average, UI Adjusted
6,000			90.91% Pervious Area
600			9.09% Impervious Area
600			100.00% Unconnected

Subcatchment PR-5C: SLOPE



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond 1P: rain garden#1 cascading

Inflow Area = 0.725 ac, 65.66% Impervious, Inflow Depth = 2.91" for 10 yr event
 Inflow = 2.41 cfs @ 12.09 hrs, Volume= 0.176 af
 Outflow = 2.35 cfs @ 12.11 hrs, Volume= 0.174 af, Atten= 2%, Lag= 1.0 min
 Primary = 2.35 cfs @ 12.11 hrs, Volume= 0.174 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 61.88' @ 12.11 hrs Surf.Area= 472 sf Storage= 494 cf

Flood Elev= 63.00' Surf.Area= 660 sf Storage= 1,132 cf

Plug-Flow detention time= 49.3 min calculated for 0.174 af (99% of inflow)

Center-of-Mass det. time= 43.5 min (855.2 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,048 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 1,348 cf Overall - 300 cf Embedded = 1,048 cf
#2	58.50'	30 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 75 cf Overall x 40.0% Voids
#3	59.00'	50 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 199 cf Overall x 25.0% Voids
#4	60.33'	5 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 26 cf Overall x 20.0% Voids
1,132 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
60.50	150	300	300
61.00	236	97	397
62.00	503	370	766
63.00	660	582	1,348

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
59.00	150	75	75

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	150	0	0
60.33	150	199	199

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.33	150	0	0
60.50	150	26	26

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Device	Routing	Invert	Outlet Devices
#1	Device 3	58.50'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	62.00'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	58.50'	8.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 58.50' / 58.40' S= 0.0050 ' / Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Device 3	61.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.33 cfs @ 12.11 hrs HW=61.88' TW=54.20' (Dynamic Tailwater)

← **3=Culvert** (Passes 2.33 cfs of 2.93 cfs potential flow)

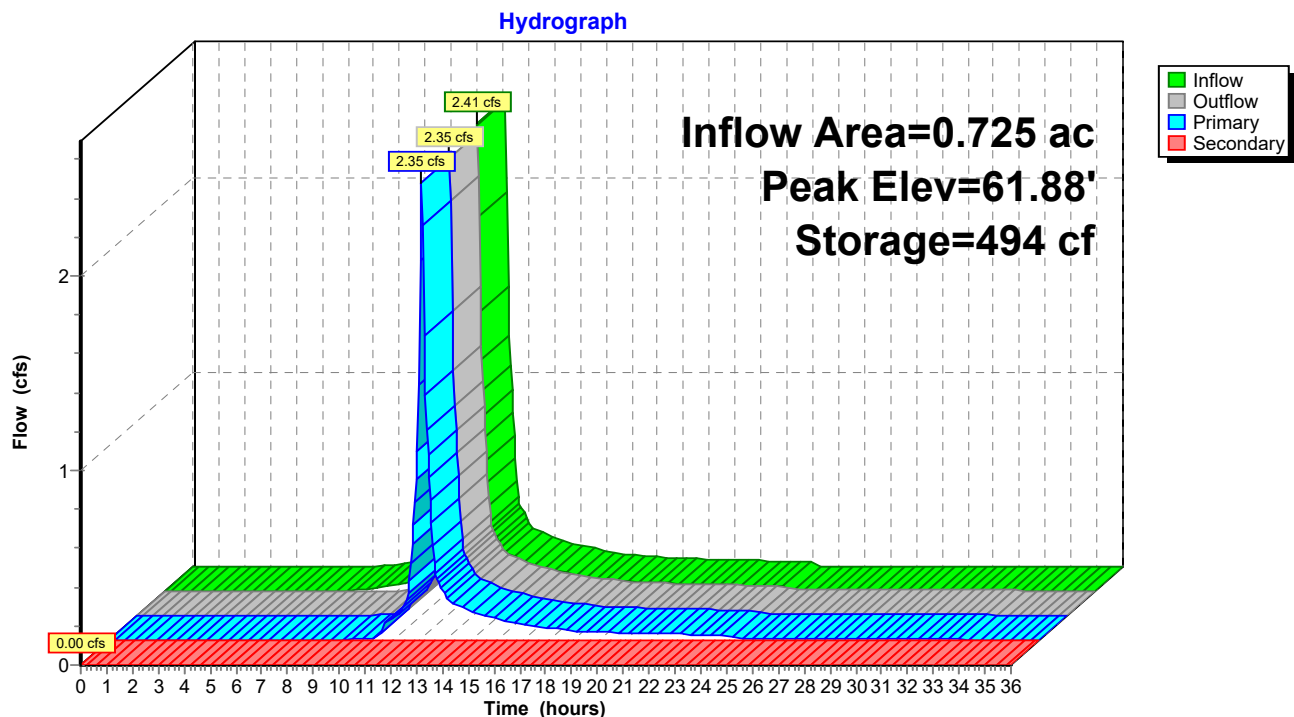
← **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

← **4=Orifice/Grate** (Orifice Controls 2.32 cfs @ 2.96 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=58.50' TW=51.00' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: rain garden#1 cascading



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Summary for Pond 2P: rain garden#2 cascading

Inflow Area = 0.966 ac, 61.39% Impervious, Inflow Depth > 2.75" for 10 yr event
 Inflow = 3.01 cfs @ 12.10 hrs, Volume= 0.222 af
 Outflow = 2.68 cfs @ 12.15 hrs, Volume= 0.214 af, Atten= 11%, Lag= 2.6 min
 Primary = 2.68 cfs @ 12.15 hrs, Volume= 0.214 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 54.25' @ 12.15 hrs Surf.Area= 849 sf Storage= 963 cf

Flood Elev= 55.00' Surf.Area= 1,326 sf Storage= 1,784 cf

Plug-Flow detention time= 73.1 min calculated for 0.214 af (97% of inflow)

Center-of-Mass det. time= 46.0 min (895.5 - 849.6)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,557 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 2,357 cf Overall - 800 cf Embedded = 1,557 cf
#2	51.00'	80 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 200 cf Overall x 40.0% Voids
#3	51.50'	133 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 532 cf Overall x 25.0% Voids
#4	52.83'	14 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 68 cf Overall x 20.0% Voids
		1,784 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
53.00	400	800	800
54.00	694	547	1,347
55.00	1,326	1,010	2,357

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
51.50	400	200	200

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.50	400	0	0
52.83	400	532	532

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.83	400	0	0
53.00	400	68	68

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Device	Routing	Invert	Outlet Devices
#1	Device 3	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	54.50'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	51.00'	12.0" Round Culvert L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 51.00' / 50.88' S= 0.0048 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Device 3	53.75'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.68 cfs @ 12.15 hrs HW=54.24' TW=48.92' (Dynamic Tailwater)

3=Culvert (Passes 2.68 cfs of 6.26 cfs potential flow)

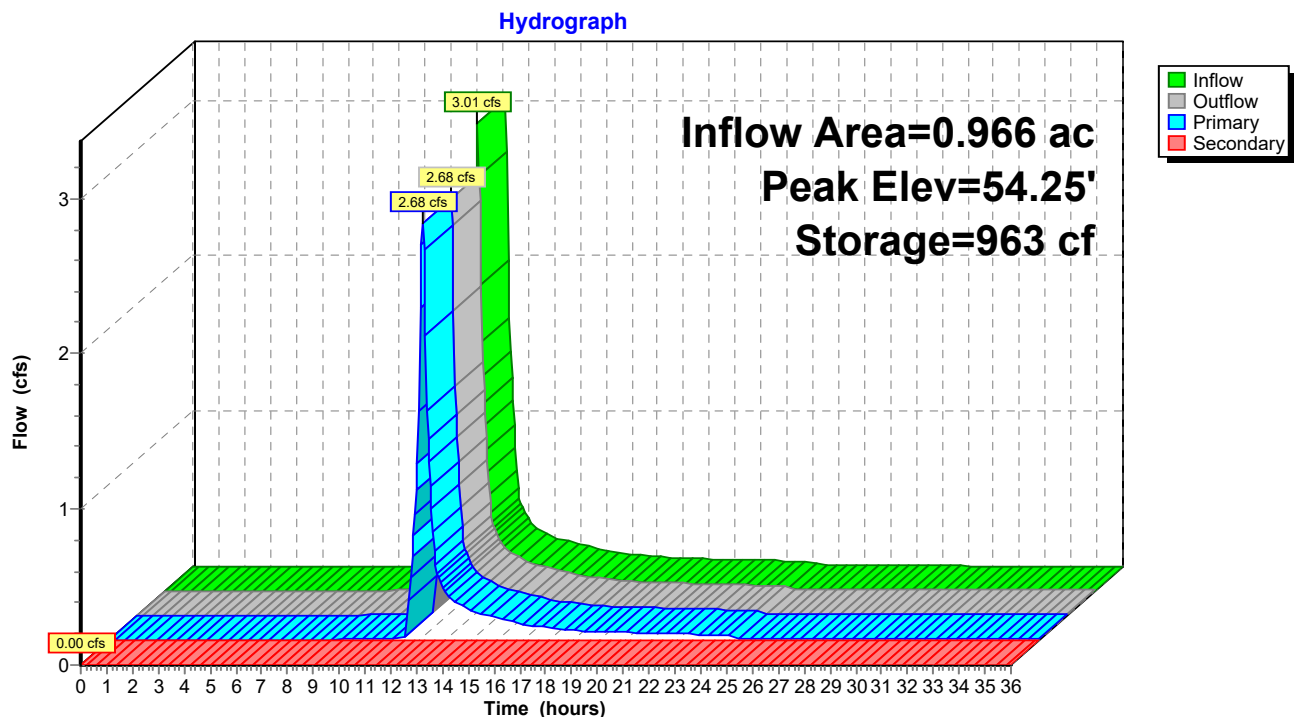
1=Exfiltration (Exfiltration Controls 0.02 cfs)

4=Orifice/Grate (Orifice Controls 2.66 cfs @ 3.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.00' TW=46.00' (Dynamic Tailwater)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: rain garden#2 cascading



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond 3P: rain garden#3 cascading

Inflow Area = 1.153 ac, 51.43% Impervious, Inflow Depth > 2.41" for 10 yr event
 Inflow = 2.86 cfs @ 12.14 hrs, Volume= 0.231 af
 Outflow = 2.88 cfs @ 12.15 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.8 min
 Primary = 2.88 cfs @ 12.15 hrs, Volume= 0.217 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 48.92' @ 12.16 hrs Surf.Area= 930 sf Storage= 1,047 cf

Flood Elev= 50.00' Surf.Area= 1,373 sf Storage= 2,283 cf

Plug-Flow detention time= 101.5 min calculated for 0.217 af (94% of inflow)

Center-of-Mass det. time= 45.1 min (939.5 - 894.4)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	1,944 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 3,144 cf Overall - 1,200 cf Embedded = 1,944 cf
#2	46.00'	120 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 300 cf Overall x 40.0% Voids
#3	46.50'	199 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 798 cf Overall x 25.0% Voids
#4	47.83'	20 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 102 cf Overall x 20.0% Voids
		2,283 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
48.00	600	1,200	1,200
49.00	957	779	1,979
50.00	1,373	1,165	3,144

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
46.50	600	300	300

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.50	600	0	0
47.83	600	798	798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.83	600	0	0
48.00	600	102	102

Device	Routing	Invert	Outlet Devices
#1	Device 3	46.00'	1.020 in/hr Exfiltration over Surface area
#2	Device 3	48.75'	24.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

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Type III 24-hr 10 yr Rainfall=4.50"

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#3 Primary

46.00' 15.0" Round Culvert

L= 26.0' CPP, projecting, no headwall, $K_e = 0.900$

Inlet / Outlet Invert= 46.00' / 45.87' S= 0.0050 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

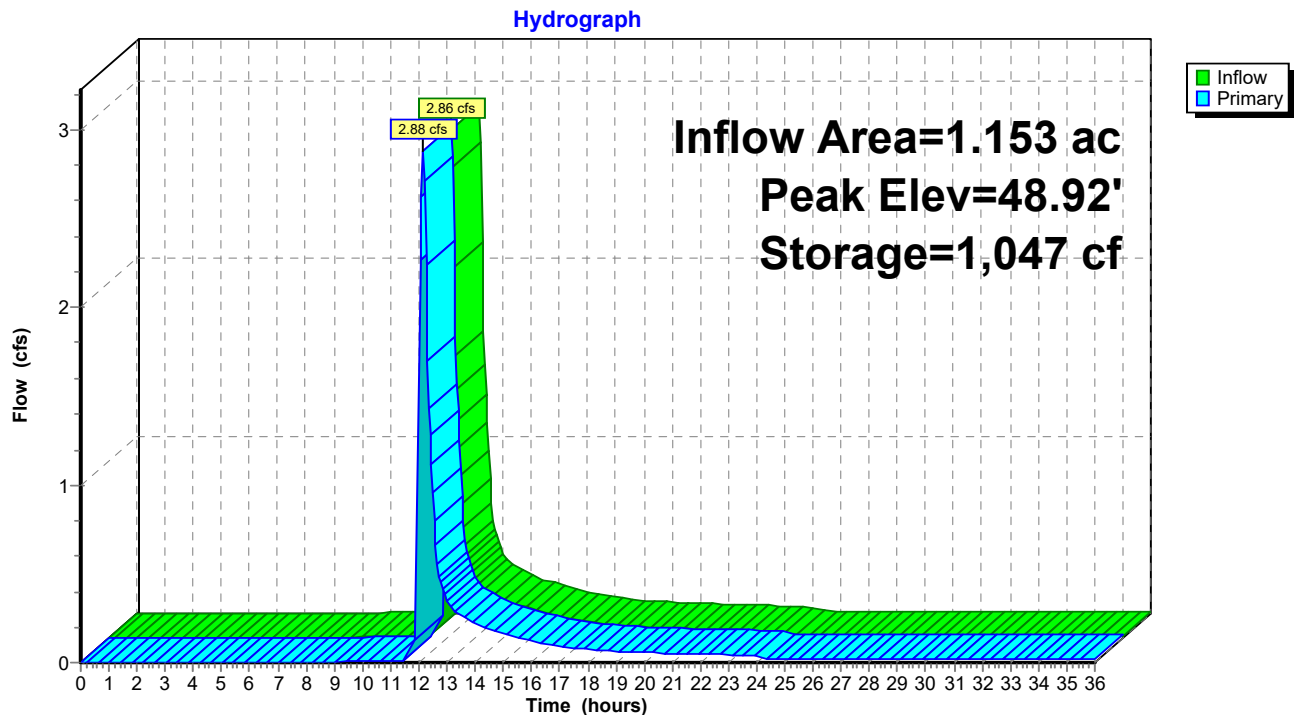
Primary OutFlow Max=2.86 cfs @ 12.15 hrs HW=48.92' TW=0.00' (Dynamic Tailwater)

3=Culvert (Passes 2.86 cfs of 7.07 cfs potential flow)

1=Exfiltration (Exfiltration Controls 0.02 cfs)

2=Orifice/Grate (Weir Controls 2.84 cfs @ 1.36 fps)

Pond 3P: rain garden#3 cascading



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond 4P: UGS-1

Inflow Area = 1.685 ac, 60.12% Impervious, Inflow Depth = 2.80" for 10 yr event
 Inflow = 5.27 cfs @ 12.09 hrs, Volume= 0.394 af
 Outflow = 4.30 cfs @ 12.15 hrs, Volume= 0.373 af, Atten= 18%, Lag= 3.7 min
 Discarded = 0.04 cfs @ 9.00 hrs, Volume= 0.098 af
 Primary = 4.26 cfs @ 12.15 hrs, Volume= 0.275 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 42.88' @ 12.15 hrs Surf.Area= 1,672 sf Storage= 3,764 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 130.7 min (937.6 - 806.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	39.50'	2,099 cf	29.92'W x 55.89'L x 5.50'H Field A 9,196 cf Overall - 3,198 cf Embedded = 5,998 cf x 35.0% Voids
#2A	40.25'	3,198 cf	ADS_StormTech MC-3500 d +Capx 28 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 28 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		5,297 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	39.50'	24.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 39.50' / 39.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	43.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Discarded	39.50'	1.020 in/hr Exfiltration over Surface area
#4	Device 1	41.83'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.04 cfs @ 9.00 hrs HW=39.56' (Free Discharge)↑ **3=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=4.24 cfs @ 12.15 hrs HW=42.87' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 4.24 cfs of 23.30 cfs potential flow)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)↑ **4=Orifice/Grate** (Orifice Controls 4.24 cfs @ 4.05 fps)

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Type III 24-hr 10 yr Rainfall=4.50"

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Pond 4P: UGS-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)

Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf

Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap

Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length

4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width

9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

28 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 4 Rows = 3,197.9 cf Chamber Storage

9,196.2 cf Field - 3,197.9 cf Chambers = 5,998.4 cf Stone x 35.0% Voids = 2,099.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,297.3 cf = 0.122 af

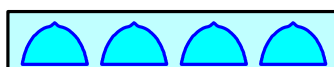
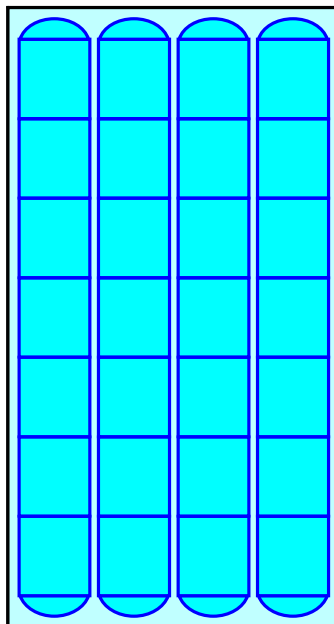
Overall Storage Efficiency = 57.6%

Overall System Size = 55.89' x 29.92' x 5.50'

28 Chambers

340.6 cy Field

222.2 cy Stone



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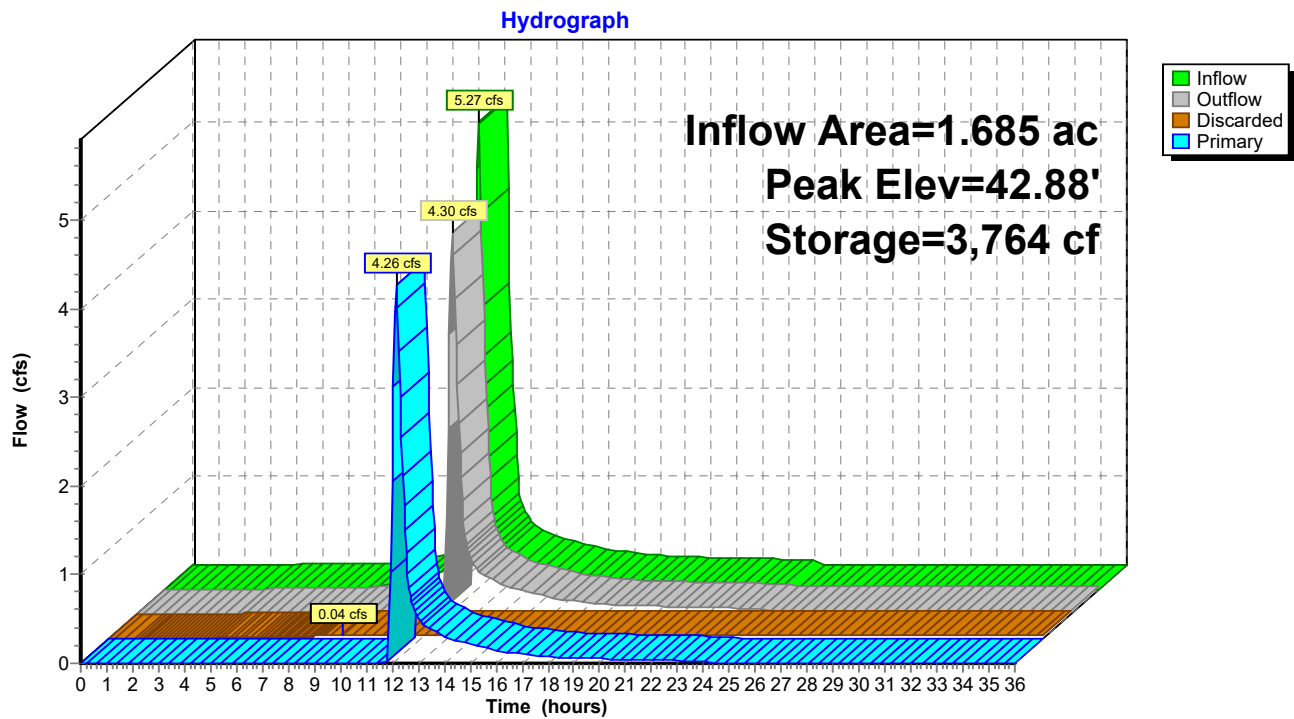
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Type III 24-hr 10 yr Rainfall=4.50"

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Pond 4P: UGS-1



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Summary for Pond BB 01 B: BB 01 B

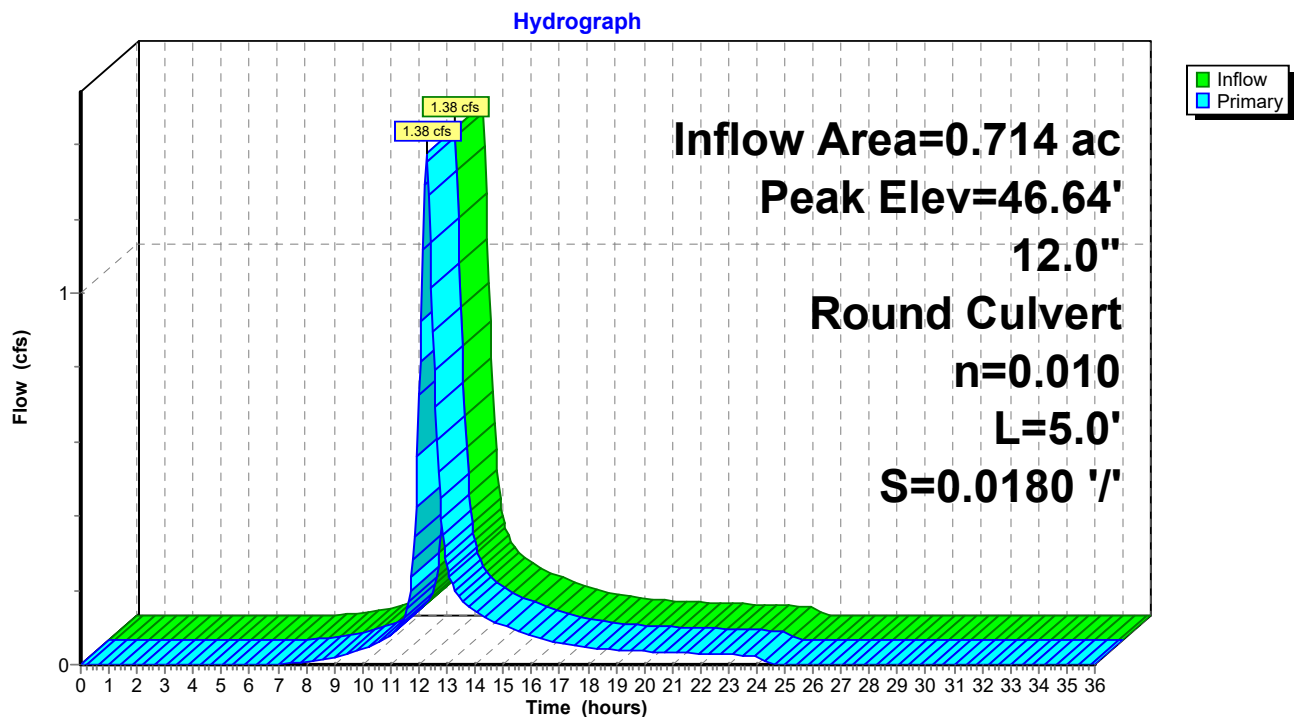
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 2.55" for 10 yr event
Inflow = 1.38 cfs @ 12.27 hrs, Volume= 0.152 af
Outflow = 1.38 cfs @ 12.27 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.27 hrs, Volume= 0.152 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.64' @ 12.65 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	12.0" Round Culvert L= 5.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.81' S= 0.0180 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.37 cfs @ 12.27 hrs HW=46.60' TW=46.19' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 1.37 cfs @ 3.28 fps)

Pond BB 01 B: BB 01 B



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond BB 01 S: BB 01 S

Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 2.55" for 10 yr event
 Inflow = 1.38 cfs @ 12.27 hrs, Volume= 0.152 af
 Outflow = 0.58 cfs @ 12.66 hrs, Volume= 0.152 af, Atten= 58%, Lag= 23.8 min
 Primary = 0.58 cfs @ 12.66 hrs, Volume= 0.152 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.60' @ 12.67 hrs Surf.Area= 0 sf Storage= 1,600 cf

Plug-Flow detention time= 23.5 min calculated for 0.151 af (100% of inflow)
 Center-of-Mass det. time= 23.5 min (852.5 - 829.0)

Volume	Invert	Avail.Storage	Storage Description
#1	44.97'	3,256 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.97	0	0
45.30	16	16
45.80	236	252
46.30	825	1,077
46.80	876	1,953
47.30	792	2,745
47.80	511	3,256

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	4.0" Round Culvert L= 8.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 44.87' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	46.40'	6.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.40' / 46.30' S= 0.0200 ' S= 0.0200 ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf

Primary OutFlow Max=0.58 cfs @ 12.66 hrs HW=46.60' TW=45.35' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.47 cfs @ 5.38 fps)

2=Culvert (Inlet Controls 0.11 cfs @ 1.51 fps)

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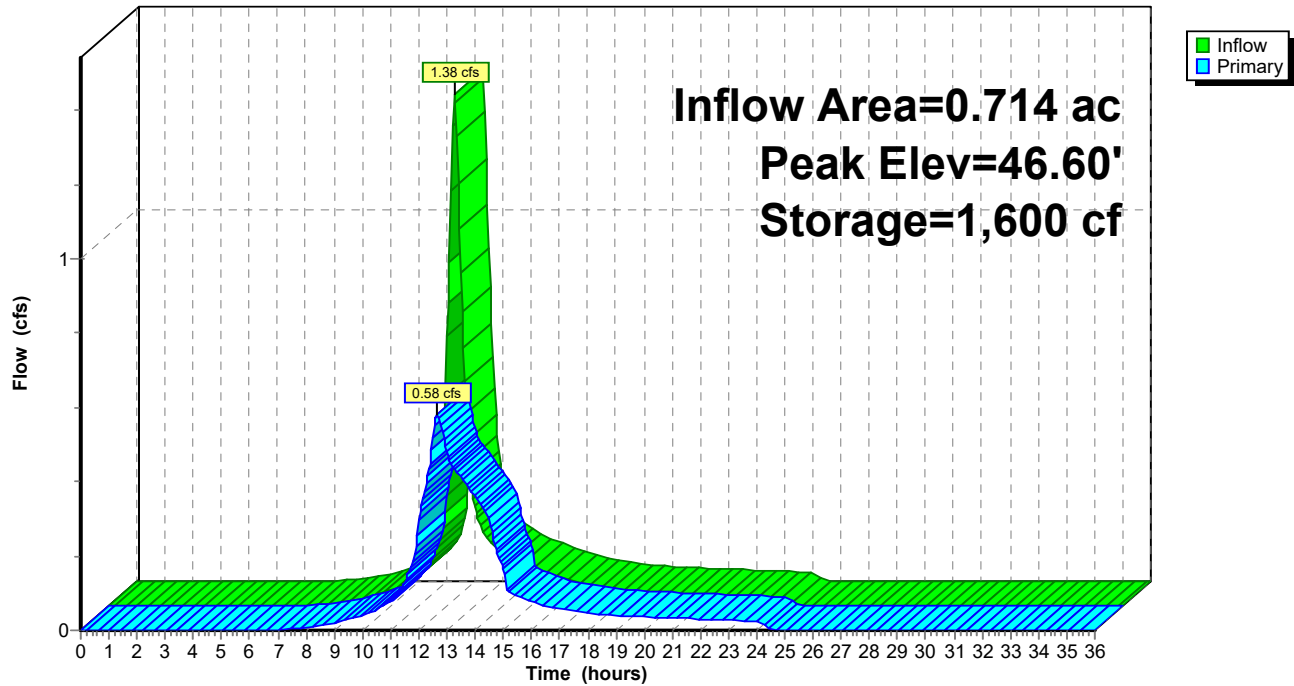
Type III 24-hr 10 yr Rainfall=4.50"

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Pond BB 01 S: BB 01 S

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond BB 06 B: BB 06 B

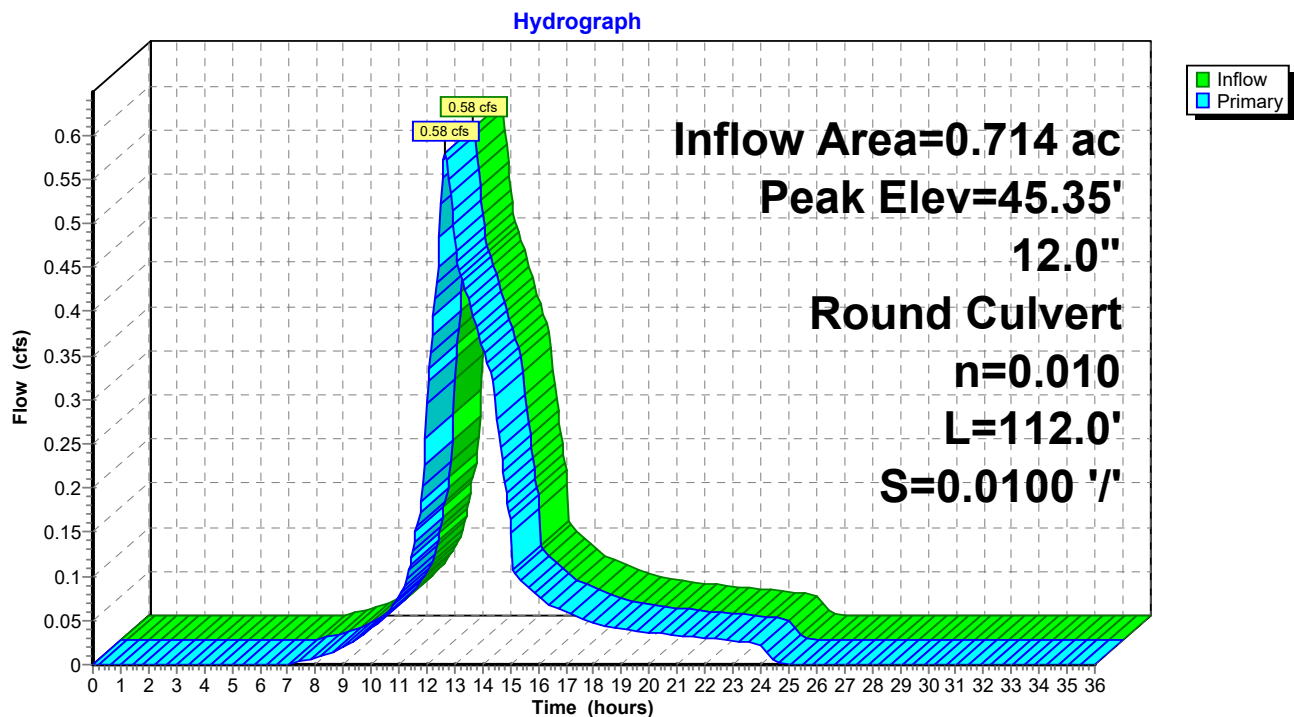
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 2.55" for 10 yr event
Inflow = 0.58 cfs @ 12.66 hrs, Volume= 0.152 af
Outflow = 0.58 cfs @ 12.66 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 0.58 cfs @ 12.66 hrs, Volume= 0.152 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 45.35' @ 12.66 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 43.85' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 12.66 hrs HW=45.35' TW=43.14' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 0.58 cfs @ 2.10 fps)

Pond BB 06 B: BB 06 B



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond BB 11 B: BB 11 B

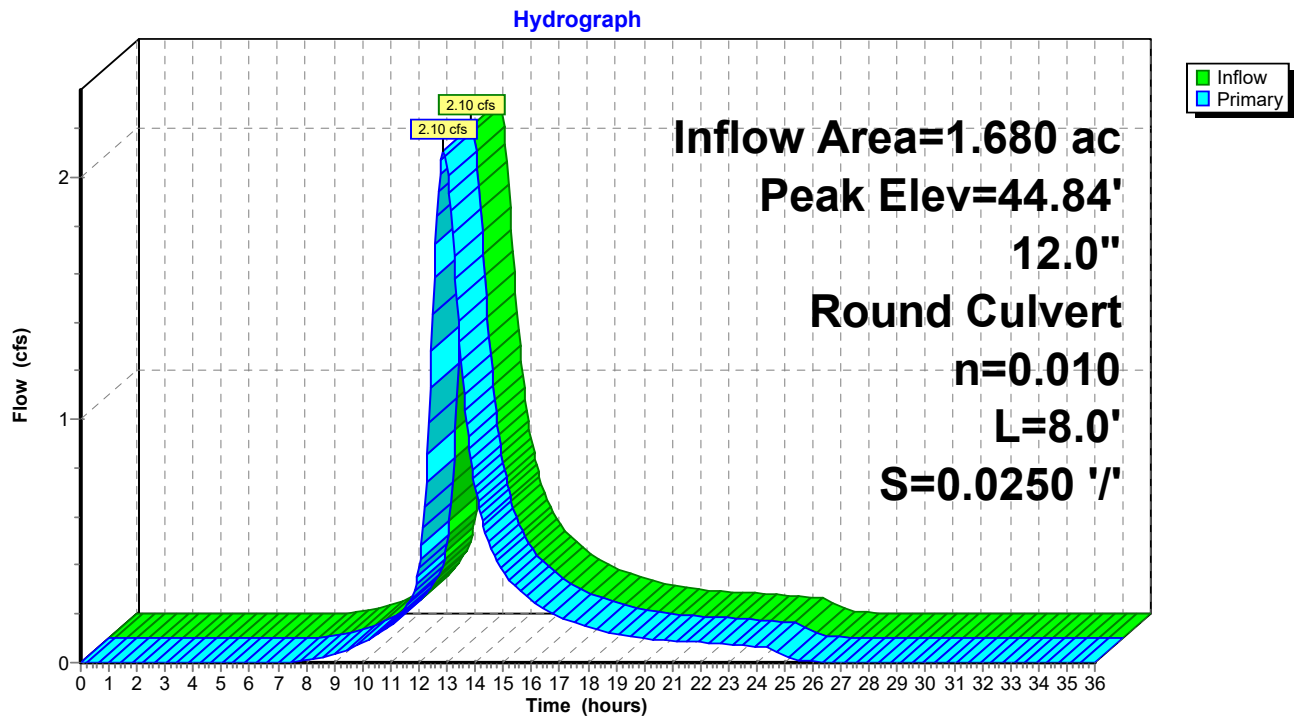
Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 2.91" for 10 yr event
Inflow = 2.10 cfs @ 12.88 hrs, Volume= 0.407 af
Outflow = 2.10 cfs @ 12.88 hrs, Volume= 0.407 af, Atten= 0%, Lag= 0.0 min
Primary = 2.10 cfs @ 12.88 hrs, Volume= 0.407 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 44.84' @ 12.88 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.00'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.00' / 43.80' S= 0.0250 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.10 cfs @ 12.88 hrs HW=44.84' TW=44.17' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 2.10 cfs @ 4.03 fps)

Pond BB 11 B: BB 11 B



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond BB 11 S: BB 11 S

Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 2.91" for 10 yr event
 Inflow = 2.10 cfs @ 12.88 hrs, Volume= 0.407 af
 Outflow = 1.55 cfs @ 13.32 hrs, Volume= 0.407 af, Atten= 26%, Lag= 26.3 min
 Primary = 1.55 cfs @ 13.32 hrs, Volume= 0.407 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.49' @ 13.32 hrs Surf.Area= 0 sf Storage= 1,849 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 7.6 min (875.7 - 868.1)

Volume	Invert	Avail.Storage	Storage Description
#1	42.97'	4,778 cf	Custom Stage Data Listed below
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
42.97	0	0	
43.30	16	16	
43.80	481	497	
44.30	963	1,460	
44.80	1,019	2,479	
45.30	1,085	3,564	
45.80	603	4,167	
46.30	611	4,778	

Device	Routing	Invert	Outlet Devices
#1	Primary	42.97'	4.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.97' / 42.81' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	39.70'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.70' / 39.60' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Primary	44.50'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.50' / 44.40' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.55 cfs @ 13.32 hrs HW=44.49' TW=43.19' (Dynamic Tailwater)

- 1=Culvert (Outlet Controls 0.48 cfs @ 5.47 fps)
 2=Culvert (Inlet Controls 1.08 cfs @ 5.48 fps)
 3=Culvert (Controls 0.00 cfs)

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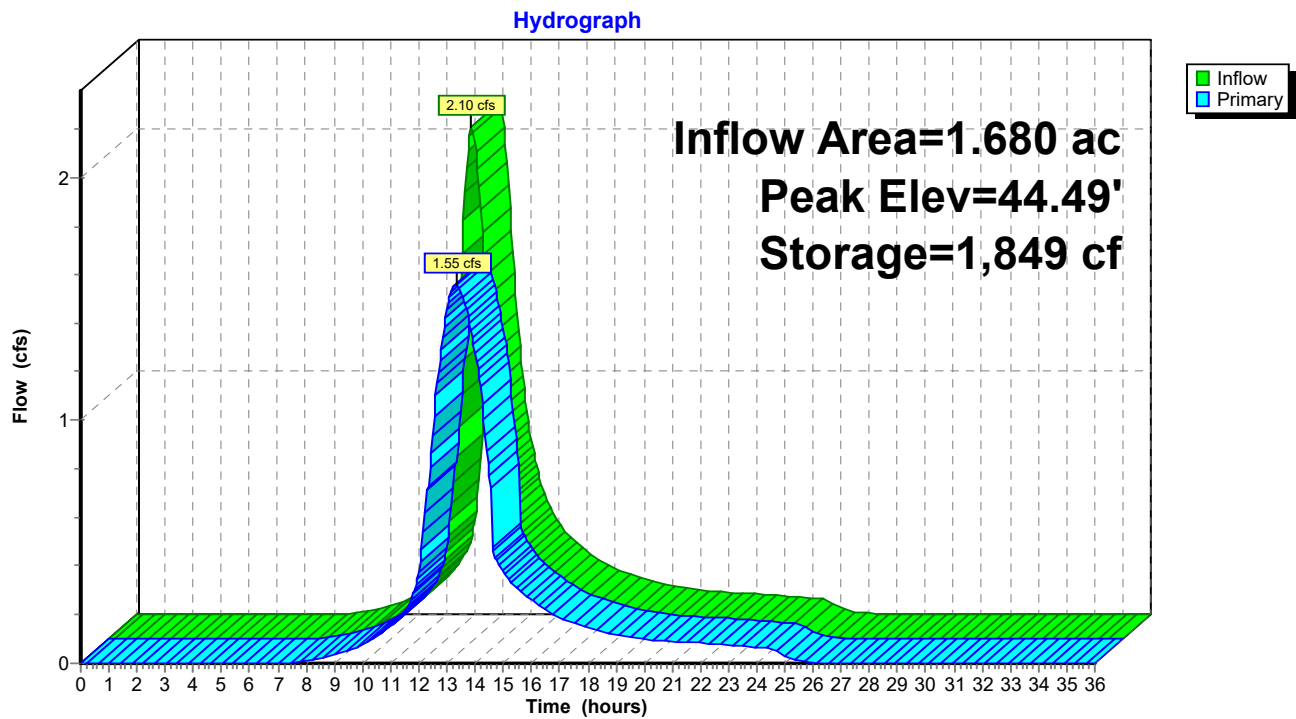
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Type III 24-hr 10 yr Rainfall=4.50"

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Pond BB 11 S: BB 11 S



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond PR-4: PR-4

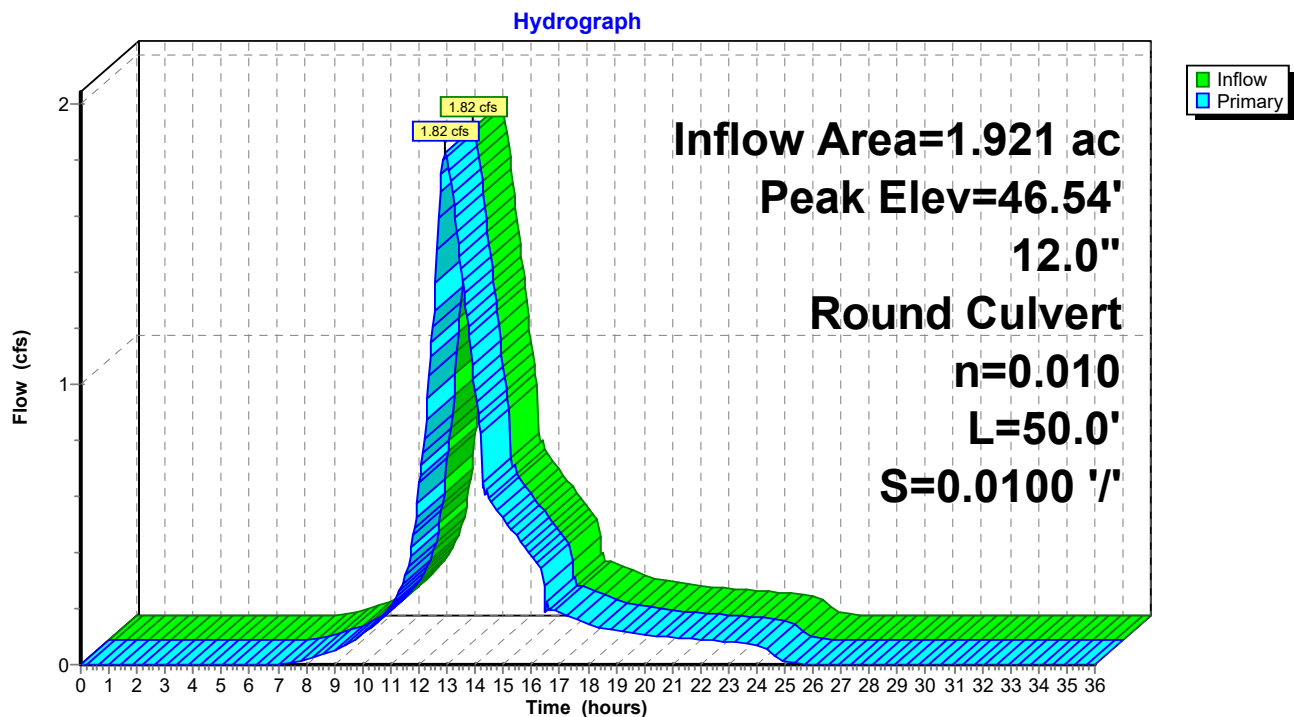
Inflow Area = 1.921 ac, 1.30% Impervious, Inflow Depth = 2.82" for 10 yr event
Inflow = 1.82 cfs @ 12.94 hrs, Volume= 0.451 af
Outflow = 1.82 cfs @ 12.94 hrs, Volume= 0.451 af, Atten= 0%, Lag= 0.0 min
Primary = 1.82 cfs @ 12.94 hrs, Volume= 0.451 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.54' @ 12.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.80'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.80' / 45.30' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.82 cfs @ 12.94 hrs HW=46.54' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.82 cfs @ 2.93 fps)

Pond PR-4: PR-4



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond PR-5: PR-5

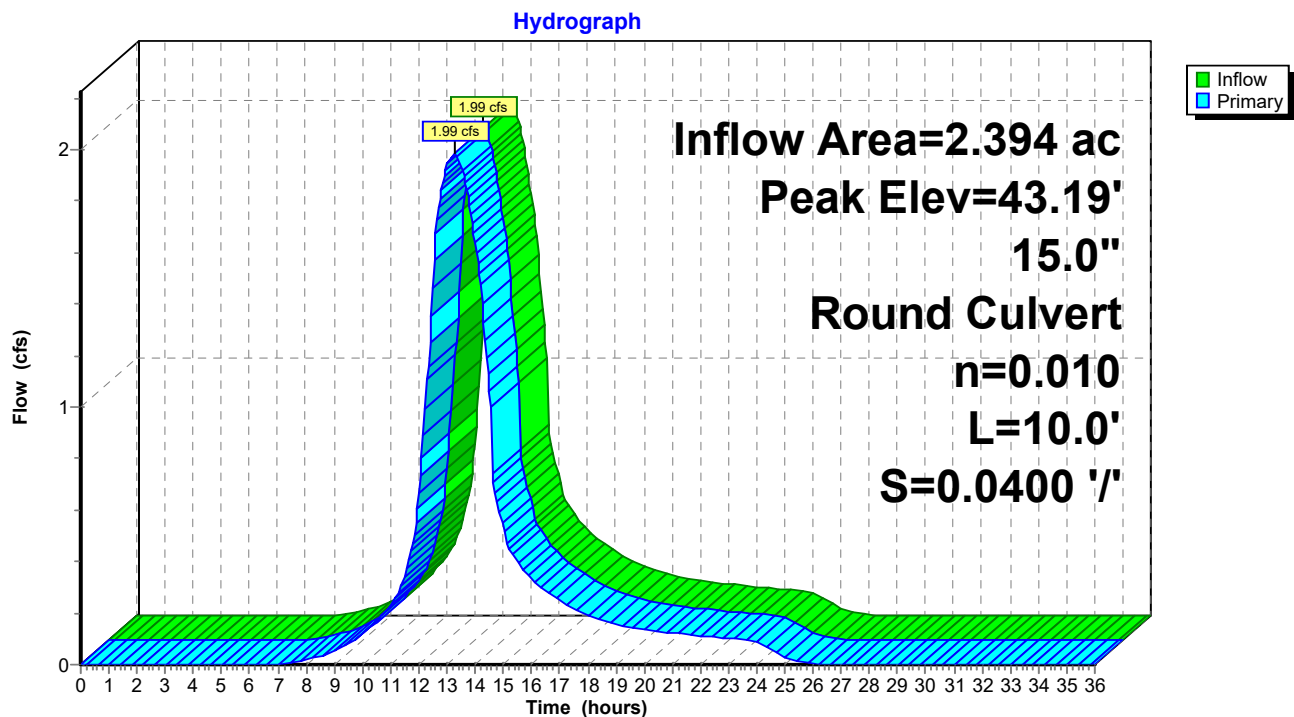
Inflow Area = 2.394 ac, 0.58% Impervious, Inflow Depth = 2.80" for 10 yr event
Inflow = 1.99 cfs @ 13.26 hrs, Volume= 0.559 af
Outflow = 1.99 cfs @ 13.26 hrs, Volume= 0.559 af, Atten= 0%, Lag= 0.0 min
Primary = 1.99 cfs @ 13.26 hrs, Volume= 0.559 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 43.19' @ 13.26 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.10' S= 0.0400 '/ Cc= 0.900 n= 0.010, Flow Area= 1.23 sf

Primary OutFlow Max=1.99 cfs @ 13.26 hrs HW=43.19' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.99 cfs @ 2.84 fps)

Pond PR-5: PR-5



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond SB 01 B: SB 01 B

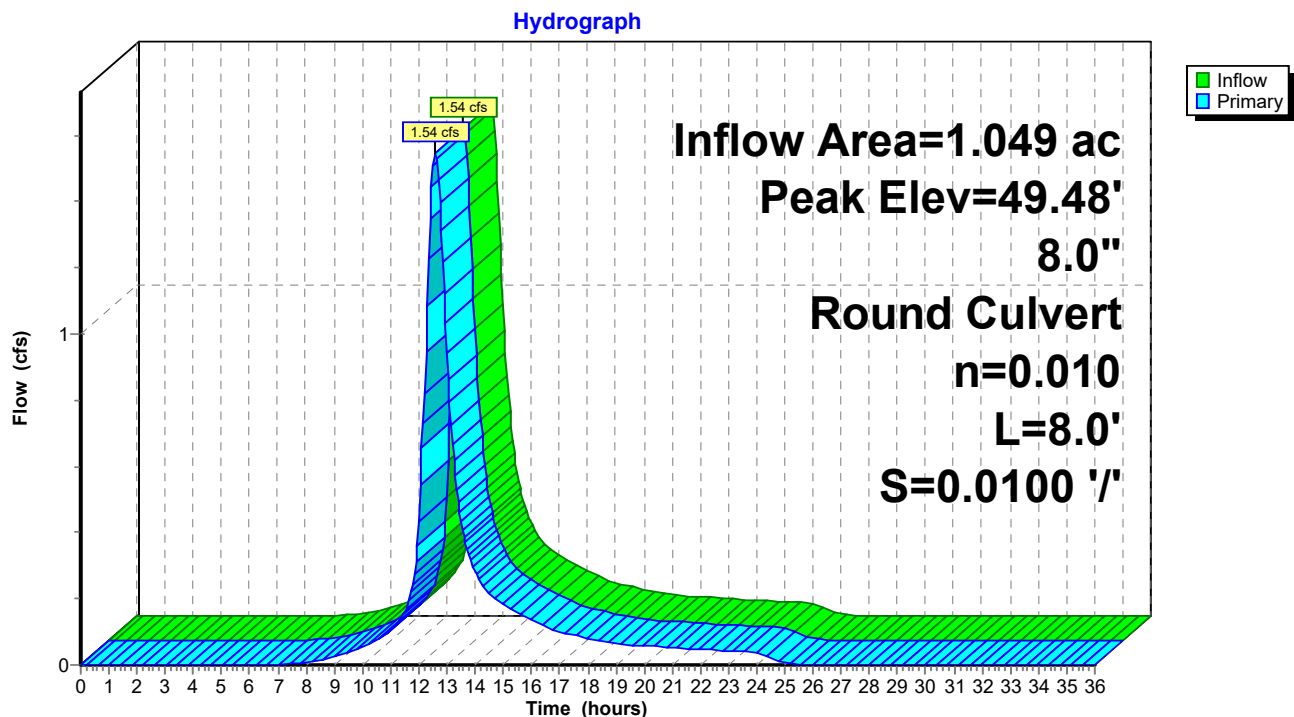
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 2.75" for 10 yr event
Inflow = 1.54 cfs @ 12.57 hrs, Volume= 0.240 af
Outflow = 1.54 cfs @ 12.57 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.57 hrs, Volume= 0.240 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 49.48' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.54 cfs @ 12.57 hrs HW=49.47' TW=47.58' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.54 cfs @ 4.41 fps)

Pond SB 01 B: SB 01 B



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond SB 01 S: SB 01 S

Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 2.75" for 10 yr event
 Inflow = 1.54 cfs @ 12.57 hrs, Volume= 0.240 af
 Outflow = 0.99 cfs @ 12.97 hrs, Volume= 0.240 af, Atten= 36%, Lag= 23.7 min
 Primary = 0.99 cfs @ 12.97 hrs, Volume= 0.240 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.90' @ 12.98 hrs Surf.Area= 0 sf Storage= 1,424 cf

Plug-Flow detention time= 9.7 min calculated for 0.240 af (100% of inflow)
 Center-of-Mass det. time= 9.7 min (857.1 - 847.3)

Volume	Invert	Avail.Storage	Storage Description
#1	46.30'	4,121 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.30	0	0
46.80	16	16
47.30	386	402
47.80	837	1,239
48.30	886	2,125
48.80	943	3,068
49.30	523	3,591
49.80	530	4,121

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.30' / 46.20' S= 0.0125 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

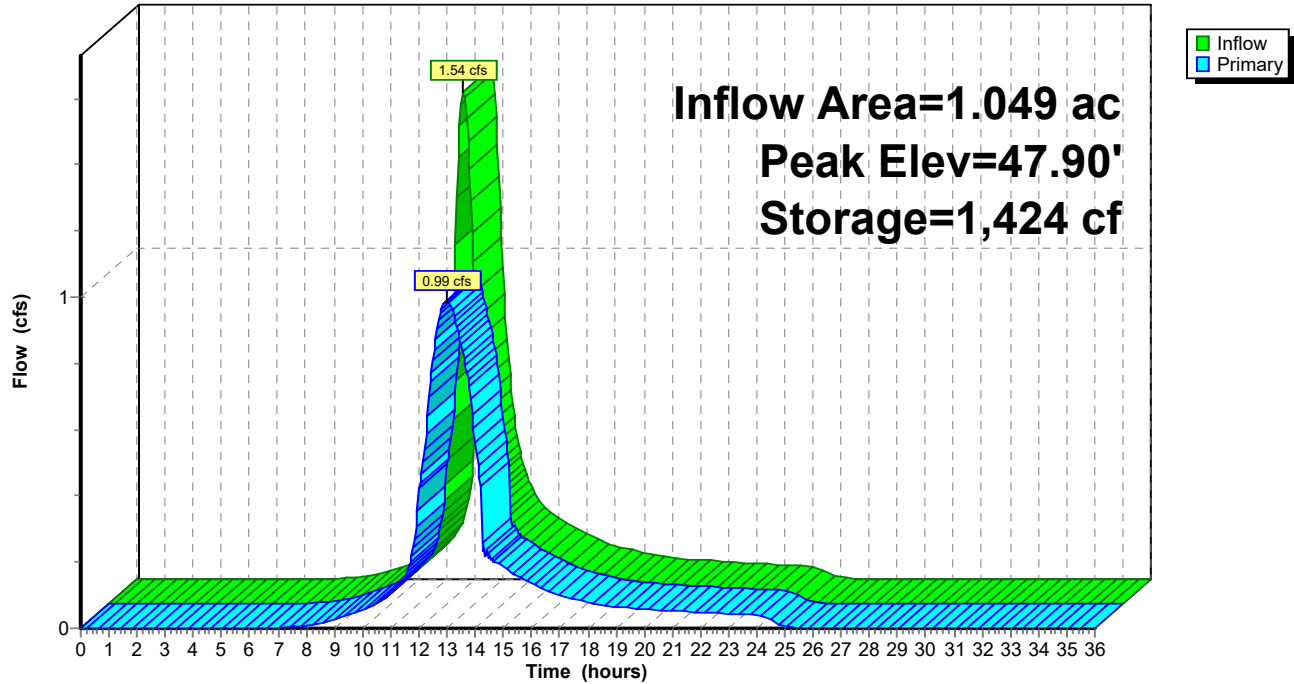
Primary OutFlow Max=0.99 cfs @ 12.97 hrs HW=47.90' TW=46.82' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.99 cfs @ 5.02 fps)

2=Culvert (Controls 0.00 cfs)

Pond SB 01 S: SB 01 S

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond SB 03 B: SB 03B

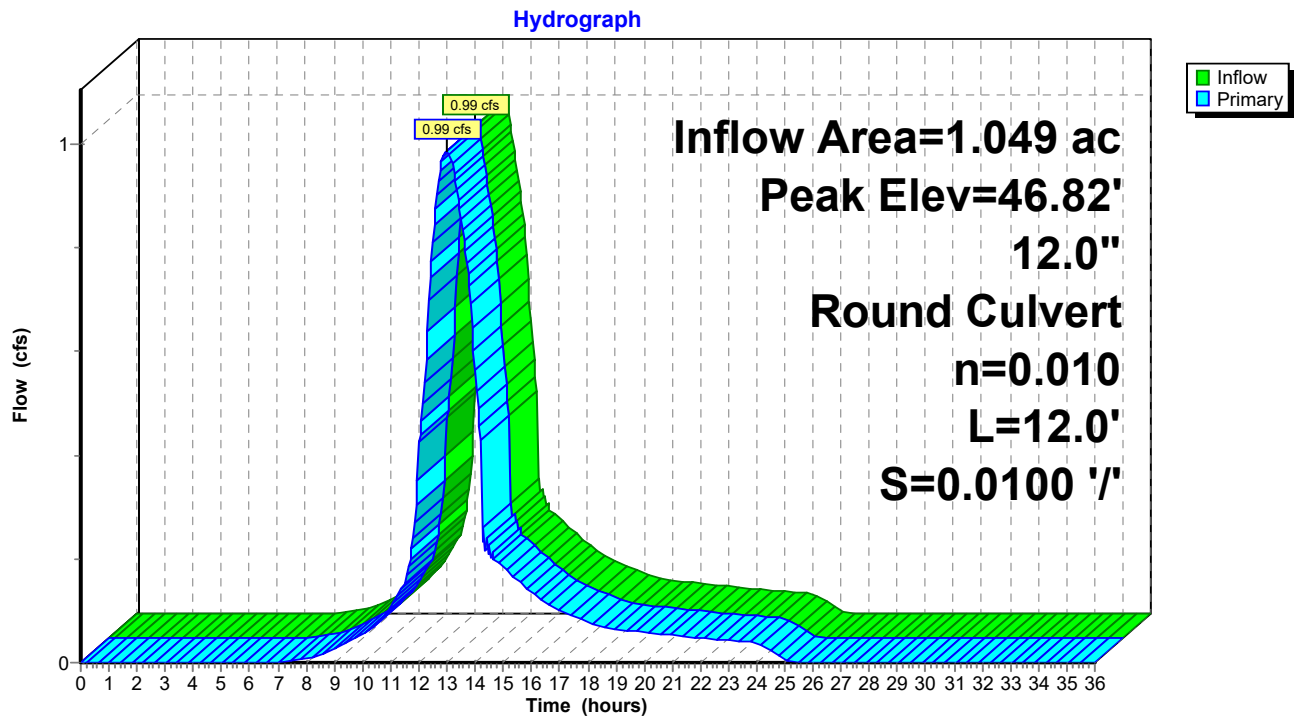
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 2.75" for 10 yr event
Inflow = 0.99 cfs @ 12.97 hrs, Volume= 0.240 af
Outflow = 0.99 cfs @ 12.97 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.97 hrs, Volume= 0.240 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.82' @ 12.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 46.13' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.99 cfs @ 12.97 hrs HW=46.82' TW=46.54' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 0.99 cfs @ 3.10 fps)

Pond SB 03 B: SB 03B



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond SB 11 B: SB 11 B

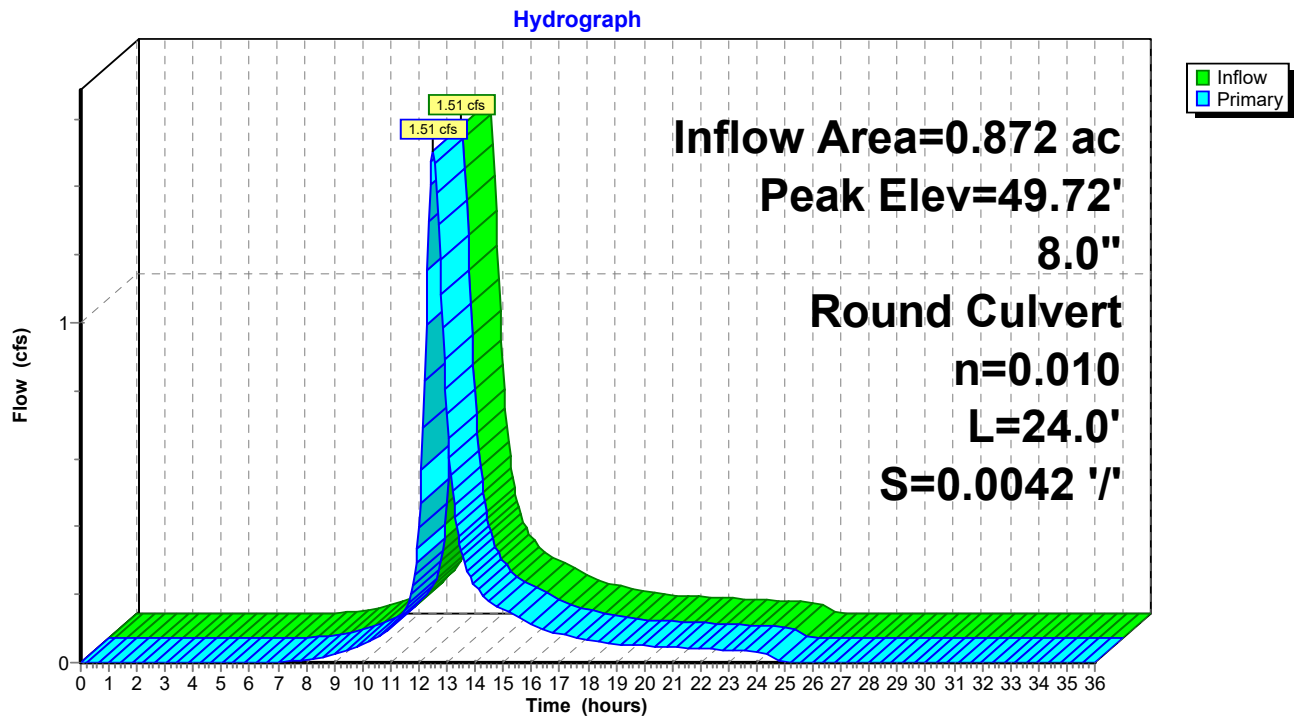
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 2.91" for 10 yr event
Inflow = 1.51 cfs @ 12.51 hrs, Volume= 0.211 af
Outflow = 1.51 cfs @ 12.51 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.51 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 49.72' @ 12.51 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	8.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.50' / 48.40' S= 0.0042 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.51 cfs @ 12.51 hrs HW=49.72' TW=48.04' (Dynamic Tailwater)
↑1=Culvert (Barrel Controls 1.51 cfs @ 4.31 fps)

Pond SB 11 B: SB 11 B



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond SB 11 S: SB 11 S

Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 2.91" for 10 yr event
 Inflow = 1.51 cfs @ 12.51 hrs, Volume= 0.211 af
 Outflow = 0.84 cfs @ 12.93 hrs, Volume= 0.211 af, Atten= 44%, Lag= 25.2 min
 Primary = 0.84 cfs @ 12.93 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.48' @ 12.93 hrs Surf.Area= 0 sf Storage= 2,214 cf

Plug-Flow detention time= 31.9 min calculated for 0.211 af (100% of inflow)
 Center-of-Mass det. time= 31.5 min (872.3 - 840.8)

Volume	Invert	Avail.Storage	Storage Description
#1	46.80'	3,953 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.80	0	0
47.30	16	16
47.80	888	904
48.30	944	1,848
48.80	1,001	2,849
49.30	544	3,393
49.80	560	3,953

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	4.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 46.72' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	48.10'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.10' / 48.00' S= 0.0125 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=0.84 cfs @ 12.93 hrs HW=48.48' TW=47.31' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.46 cfs @ 5.22 fps)
 2=Culvert (Barrel Controls 0.38 cfs @ 2.65 fps)

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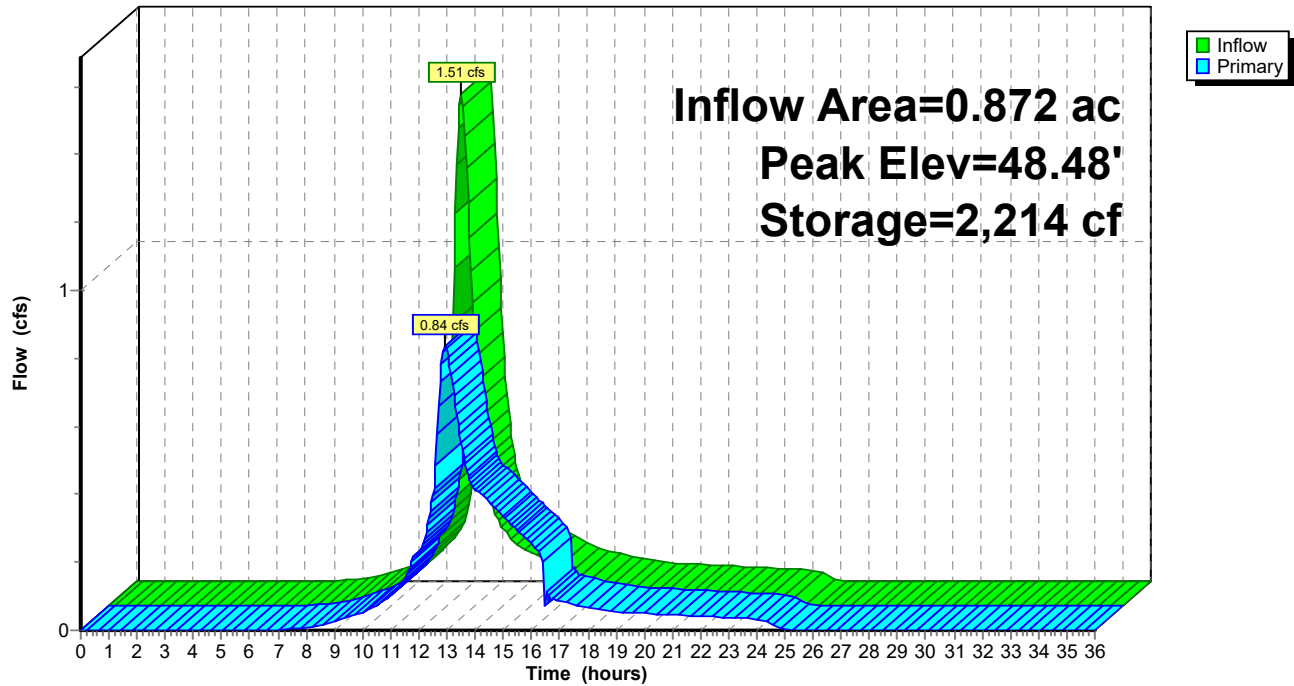
Type III 24-hr 10 yr Rainfall=4.50"

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Pond SB 11 S: SB 11 S

Hydrograph



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Type III 24-hr 10 yr Rainfall=4.50"

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Summary for Pond SB 12 B: SB 12 B

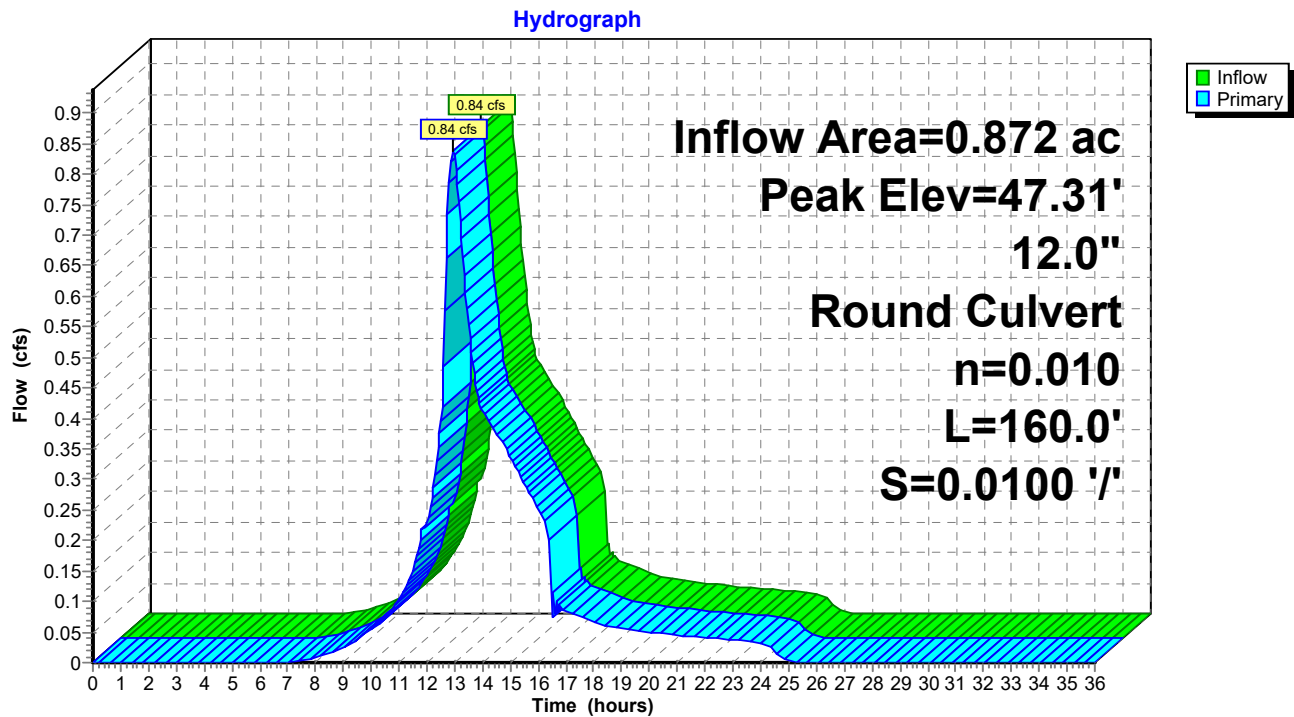
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 2.91" for 10 yr event
Inflow = 0.84 cfs @ 12.93 hrs, Volume= 0.211 af
Outflow = 0.84 cfs @ 12.93 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.93 hrs, Volume= 0.211 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.31' @ 12.94 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	12.0" Round Culvert L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 45.20' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.93 hrs HW=47.31' TW=46.54' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 0.83 cfs @ 3.04 fps)

Pond SB 12 B: SB 12 B



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Type III 24-hr 10 yr Rainfall=4.50"

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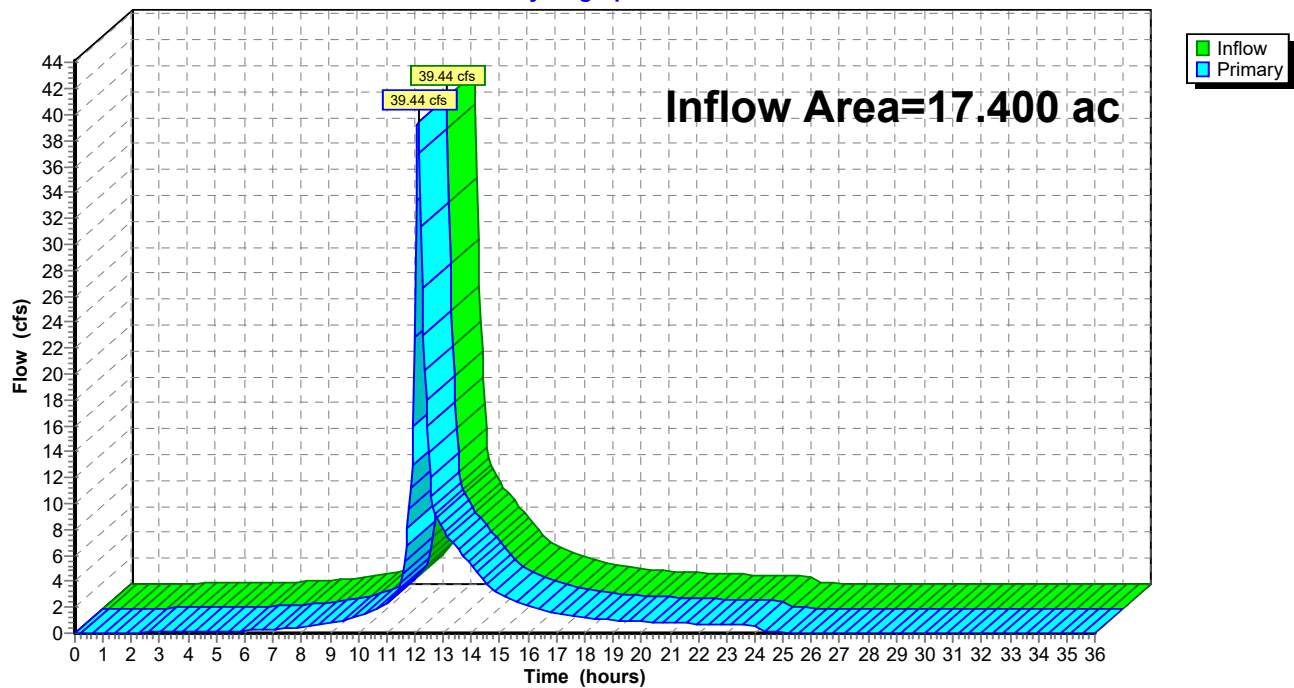
Summary for Link POA: POA

Inflow Area = 17.400 ac, 49.60% Impervious, Inflow Depth > 2.85" for 10 yr event
Inflow = 39.44 cfs @ 12.11 hrs, Volume= 4.138 af
Primary = 39.44 cfs @ 12.11 hrs, Volume= 4.138 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link POA: POA

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-1: PR-1

Runoff = 15.59 cfs @ 12.13 hrs, Volume= 1.262 af, Depth= 3.44"

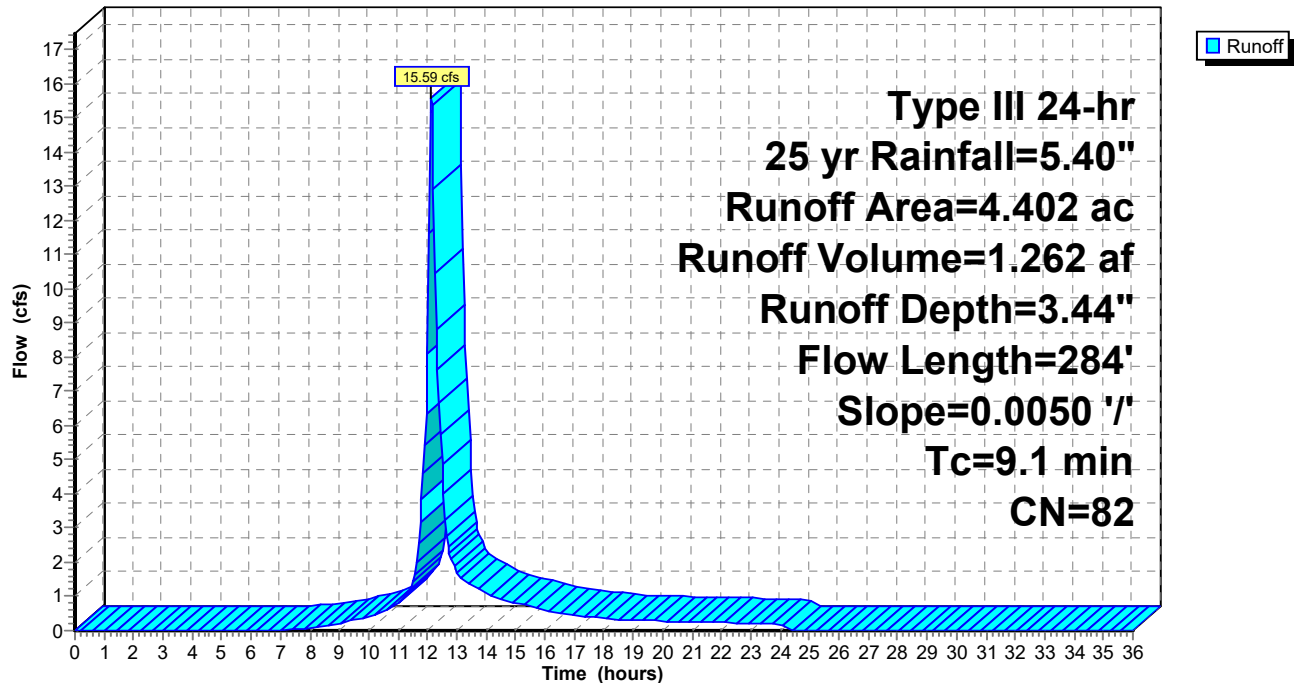
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
1.892	61	>75% Grass cover, Good, HSG B
2.510	98	Paved parking, HSG B
4.402	82	Weighted Average
1.892		42.98% Pervious Area
2.510		57.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.69		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.20"
7.9	234	0.0050	0.49		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
9.1	284	Total			

Subcatchment PR-1: PR-1

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-1A: PR-1A

Runoff = 2.27 cfs @ 12.09 hrs, Volume= 0.173 af, Depth= 4.37"

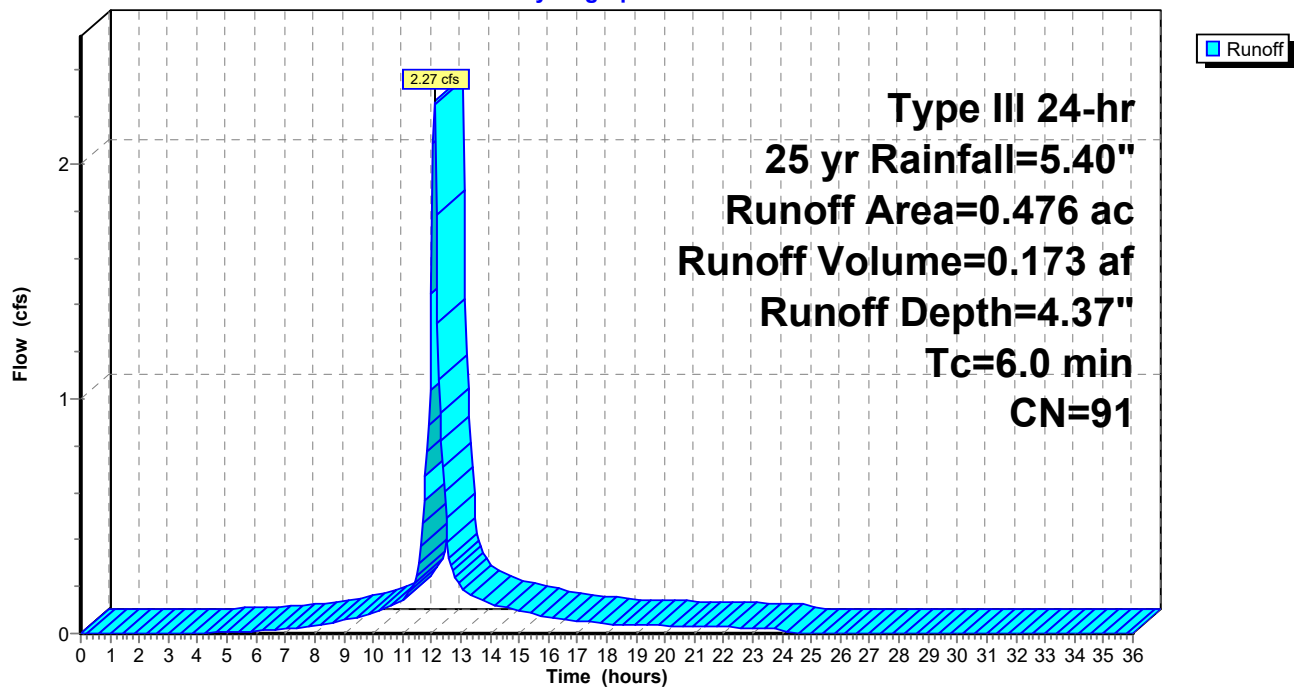
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.090	61	>75% Grass cover, Good, HSG B
0.386	98	Paved parking, HSG B
0.476	91	Weighted Average
0.090		18.91% Pervious Area
0.386		81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1A: PR-1A

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-1B: PR-1B

Runoff = 9.68 cfs @ 12.09 hrs, Volume= 0.807 af, Depth= 5.16"

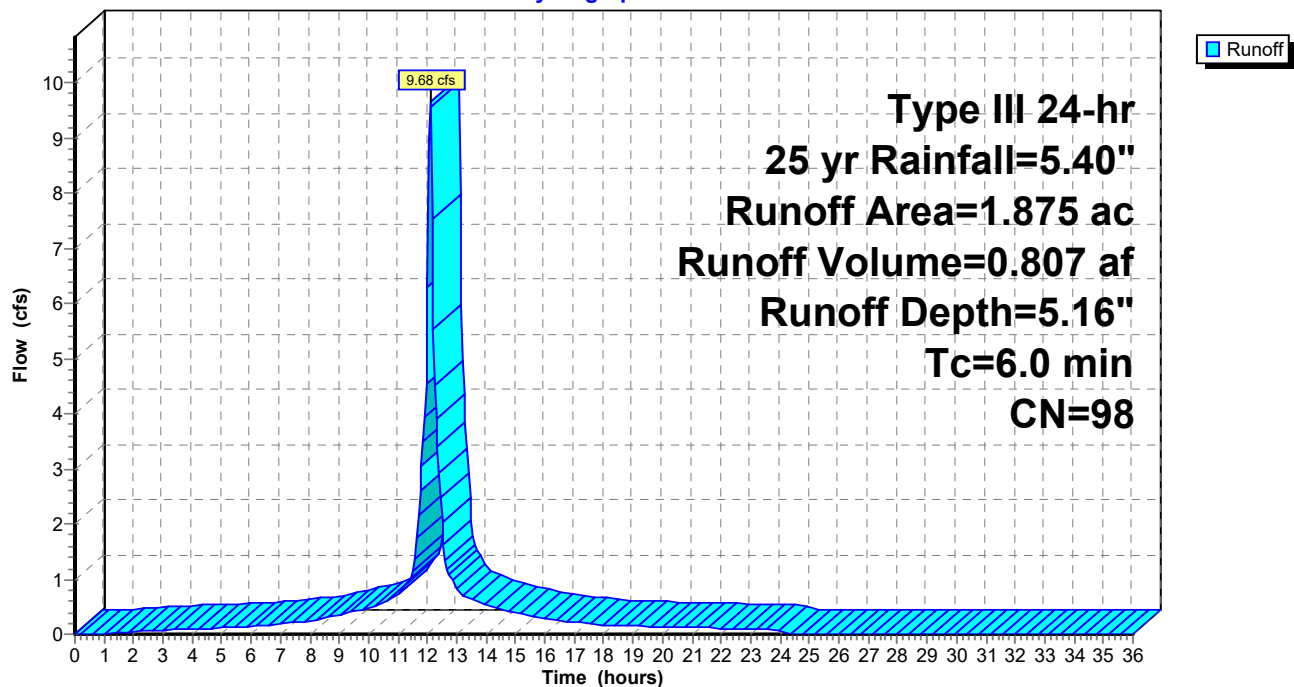
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
1.875	98	Roofs, HSG B
1.875		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1B: PR-1B

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-1C: PR-1C

Runoff = 1.47 cfs @ 12.09 hrs, Volume= 0.106 af, Depth= 2.78"

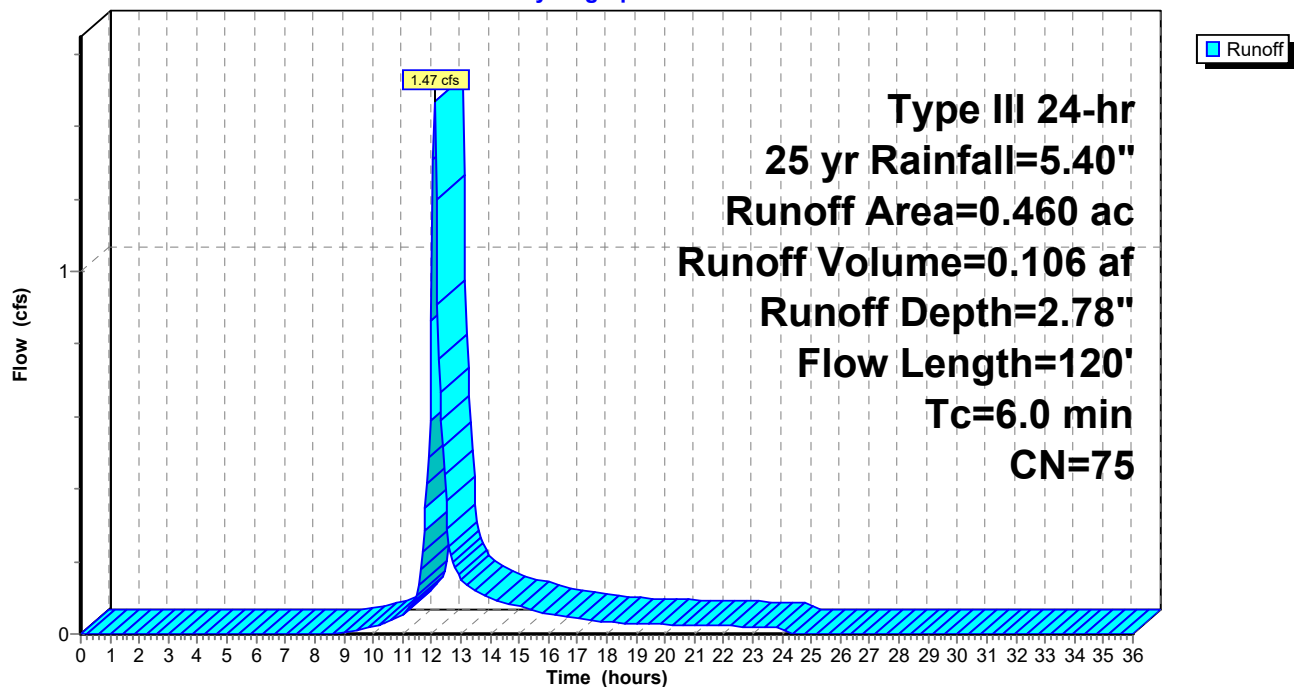
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.020	55	Woods, Good, HSG B
0.260	61	>75% Grass cover, Good, HSG B
0.180	98	Paved parking, HSG B
0.460	75	Weighted Average
0.280		60.87% Pervious Area
0.180		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	20	0.0700	0.09		Sheet Flow, 20' SF
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	40	0.5000	0.35		Sheet Flow, 30' SF
					Grass: Dense n= 0.240 P2= 3.20"
0.1	12	0.0100	1.61		Shallow Concentrated Flow, 12' SCF
					Unpaved Kv= 16.1 fps
0.2	48	0.0400	4.06		Shallow Concentrated Flow, 48' SCF
					Paved Kv= 20.3 fps
5.8	120	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-1C: PR-1C

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-1D: PR-1D

Runoff = 7.75 cfs @ 12.09 hrs, Volume= 0.646 af, Depth= 5.16"

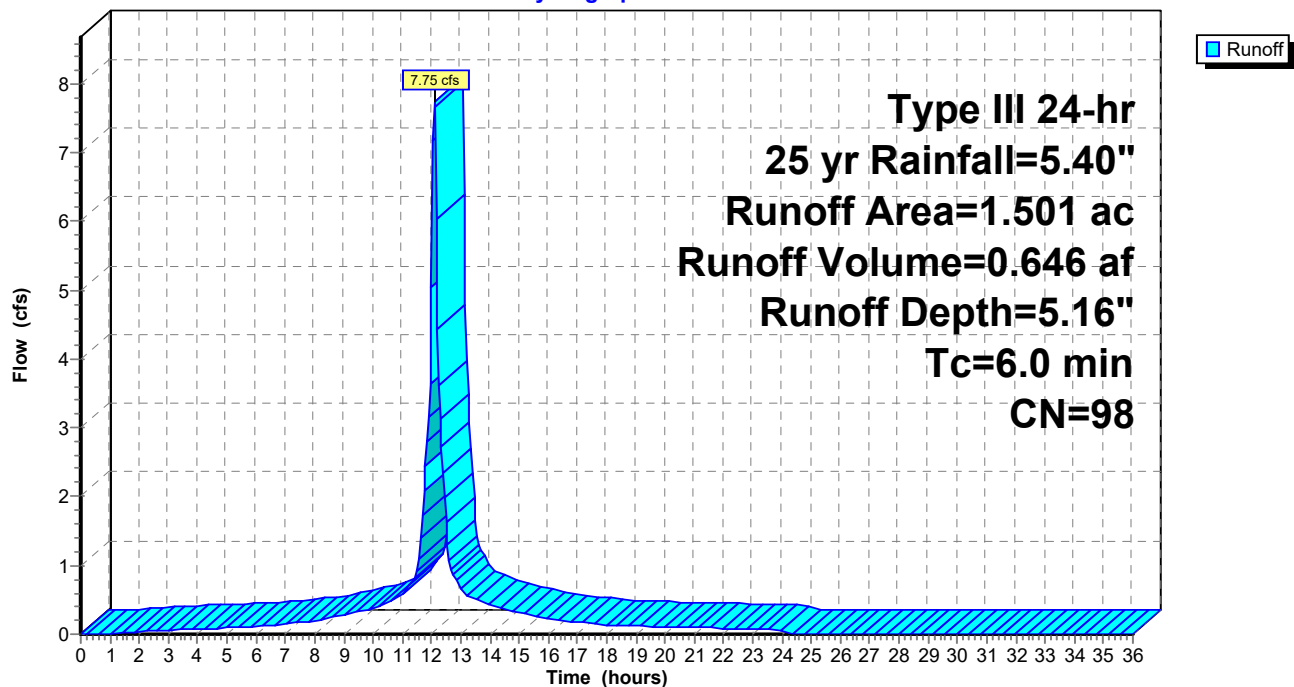
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
1.501	98	Roofs, HSG B
1.501		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1D: PR-1D

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-1E: PR-1E

Runoff = 3.89 cfs @ 12.17 hrs, Volume= 0.343 af, Depth= 2.69"

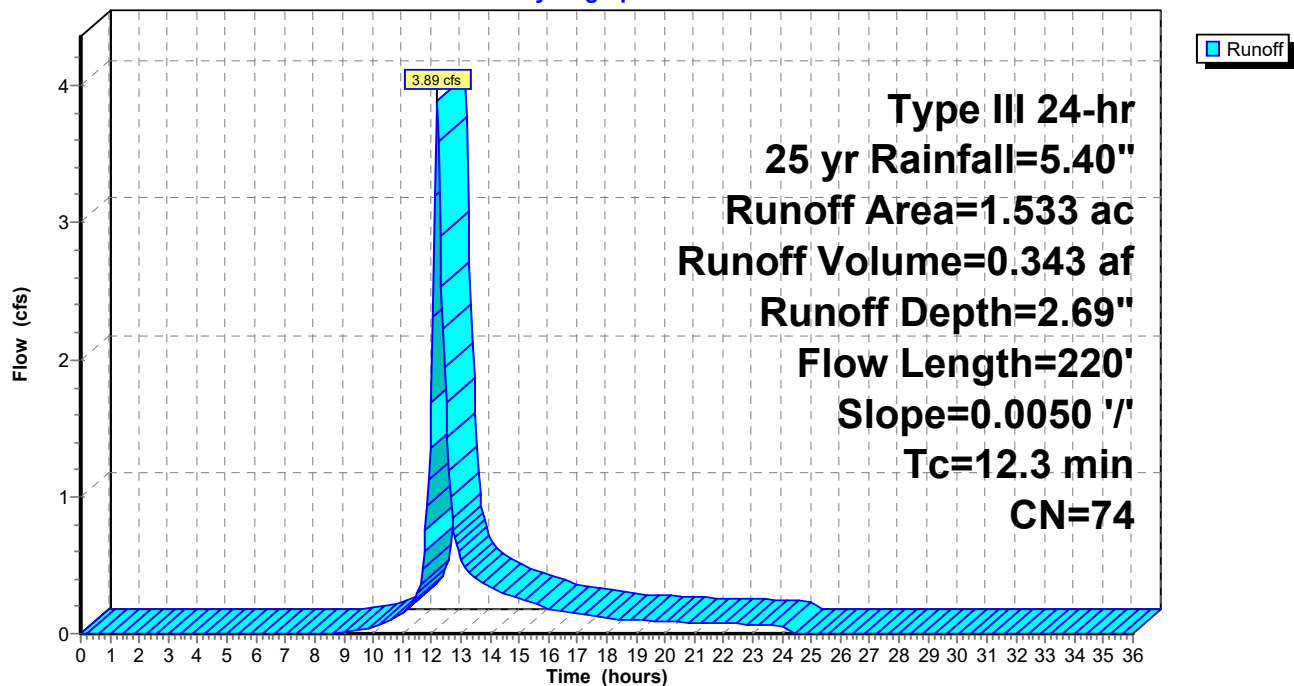
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
1.000	61	>75% Grass cover, Good, HSG B
0.533	98	Paved parking, HSG B
1.533	74	Weighted Average
1.000		65.23% Pervious Area
0.533		34.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	50	0.0050	0.09		Sheet Flow, 50' SF
					Grass: Short n= 0.150 P2= 3.20"
2.5	170	0.0050	1.14		Shallow Concentrated Flow, 170' SCF
					Unpaved Kv= 16.1 fps
12.3	220	Total			

Subcatchment PR-1E: PR-1E

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-2: PR-2

Runoff = 5.49 cfs @ 12.09 hrs, Volume= 0.399 af, Depth= 3.34"

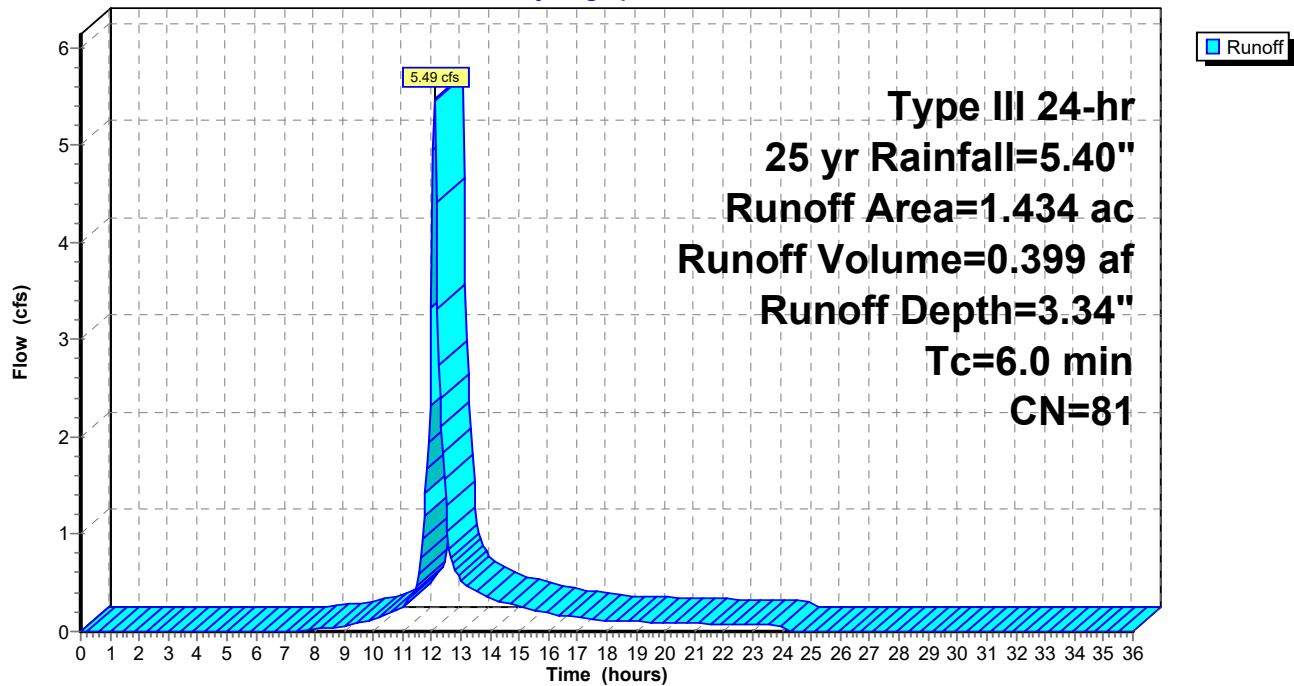
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.672	61	>75% Grass cover, Good, HSG B
0.762	98	Paved parking, HSG B
1.434	81	Weighted Average
0.672		46.86% Pervious Area
0.762		53.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: PR-2

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-2A: PR-2B

Runoff = 1.30 cfs @ 12.09 hrs, Volume= 0.108 af, Depth= 5.16"

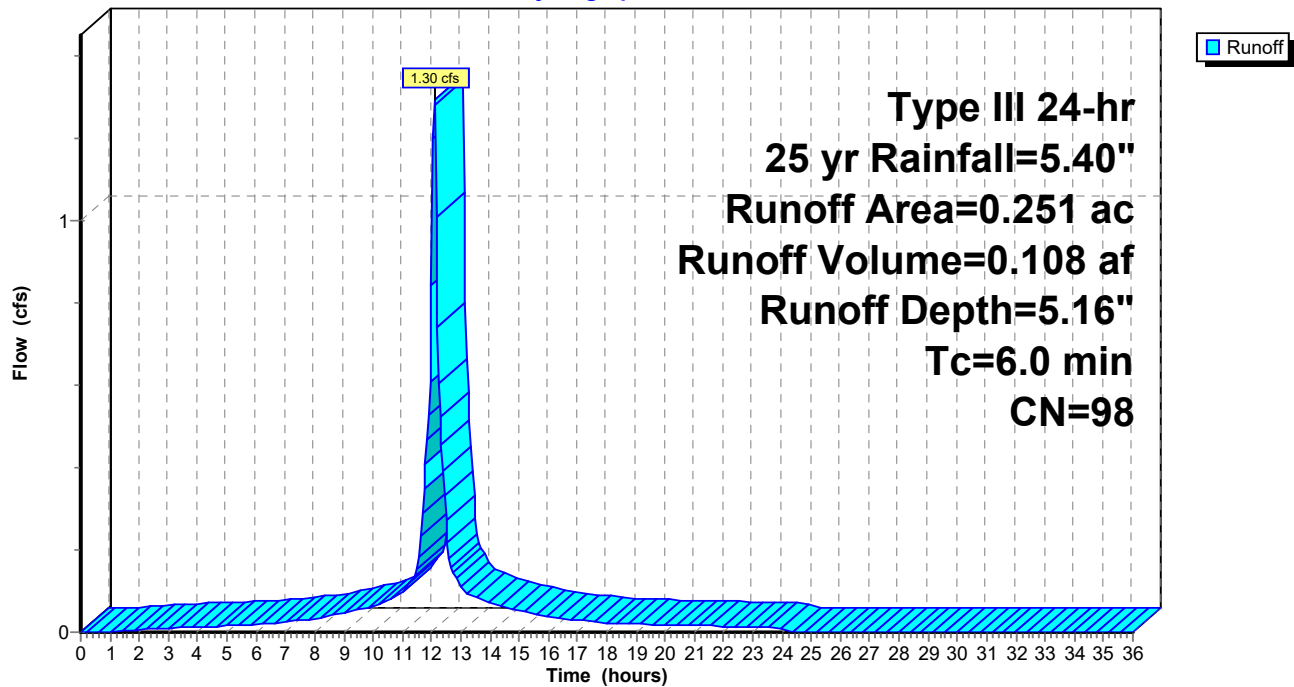
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.251	98	Roofs, HSG B
0.251		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2A: PR-2B

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-3A: PR-3A

Runoff = 3.07 cfs @ 12.09 hrs, Volume= 0.226 af, Depth= 3.74"

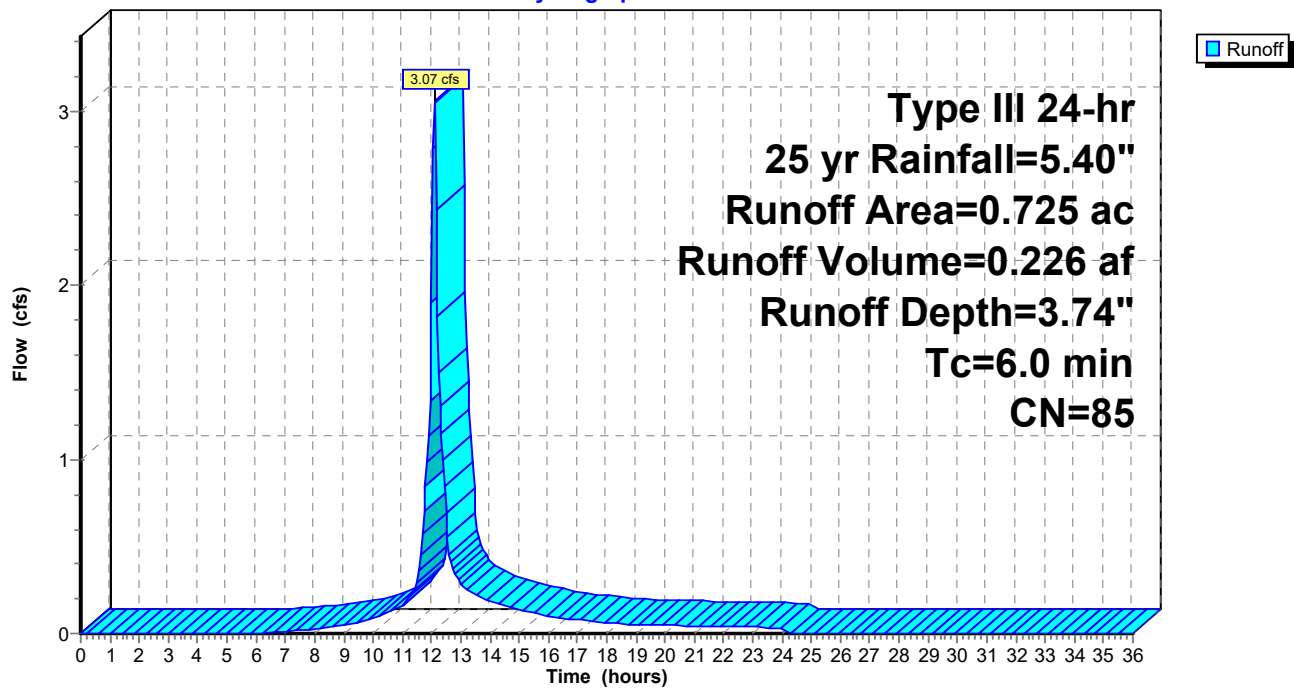
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.249	61	>75% Grass cover, Good, HSG B
0.476	98	Paved parking, HSG B
0.725	85	Weighted Average
0.249		34.34% Pervious Area
0.476		65.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3A: PR-3A

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-3B: PR-3B

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.063 af, Depth= 3.15"

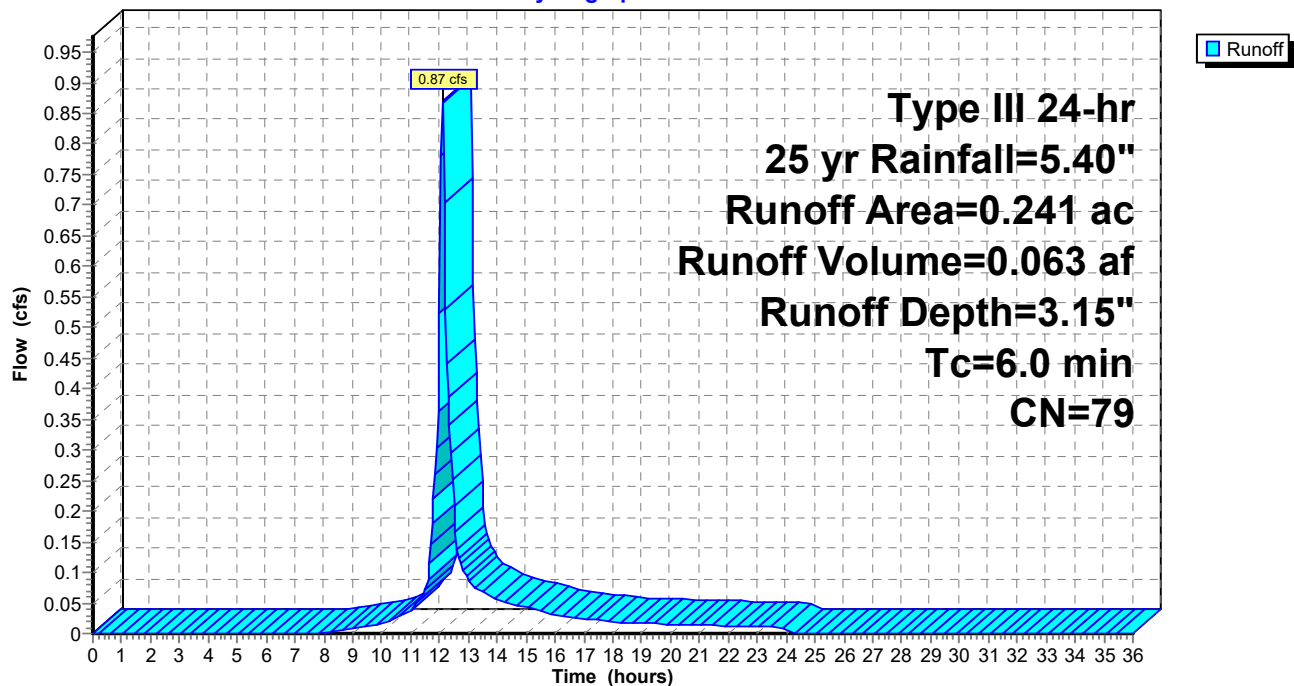
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.124	61	>75% Grass cover, Good, HSG B
0.117	98	Paved parking, HSG B
0.241	79	Weighted Average
0.124		51.45% Pervious Area
0.117		48.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3B: PR-3B

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-3C: PR-3C

Runoff = 0.32 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 1.62"

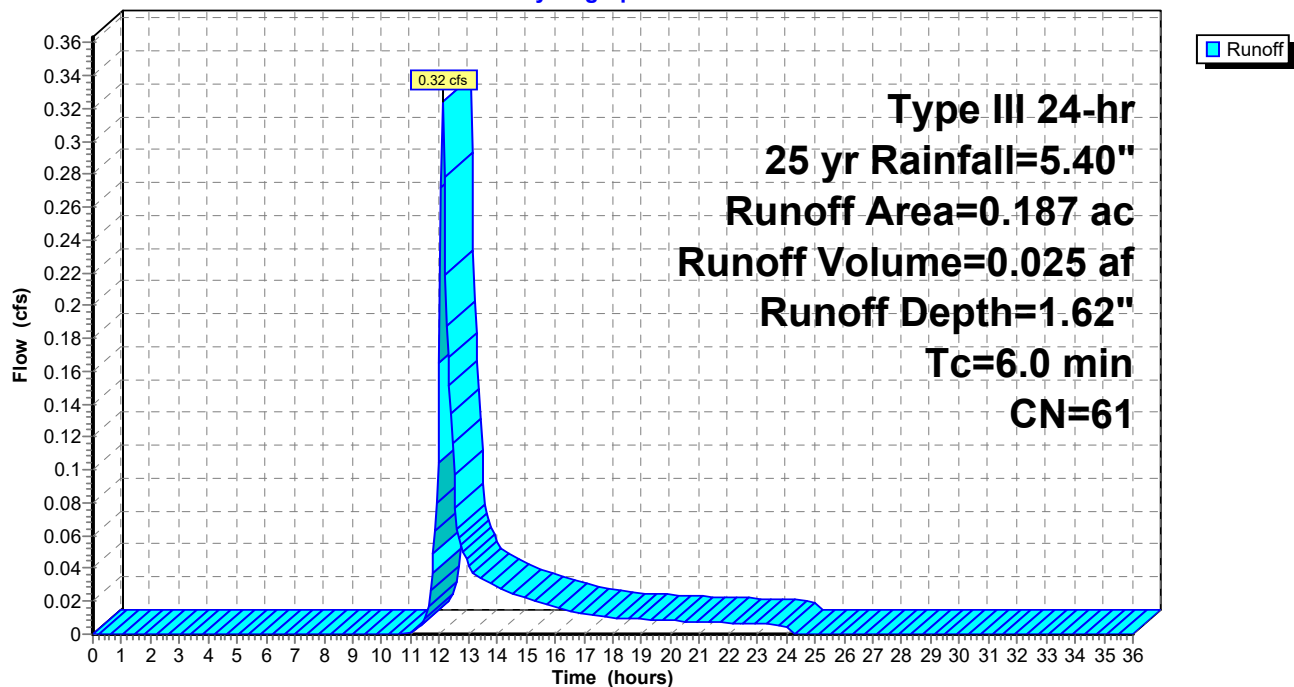
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
0.187	61	>75% Grass cover, Good, HSG B
0.187		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3C: PR-3C

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-4A: PR-5A

Runoff = 1.93 cfs @ 12.58 hrs, Volume= 0.293 af, Depth= 3.74"

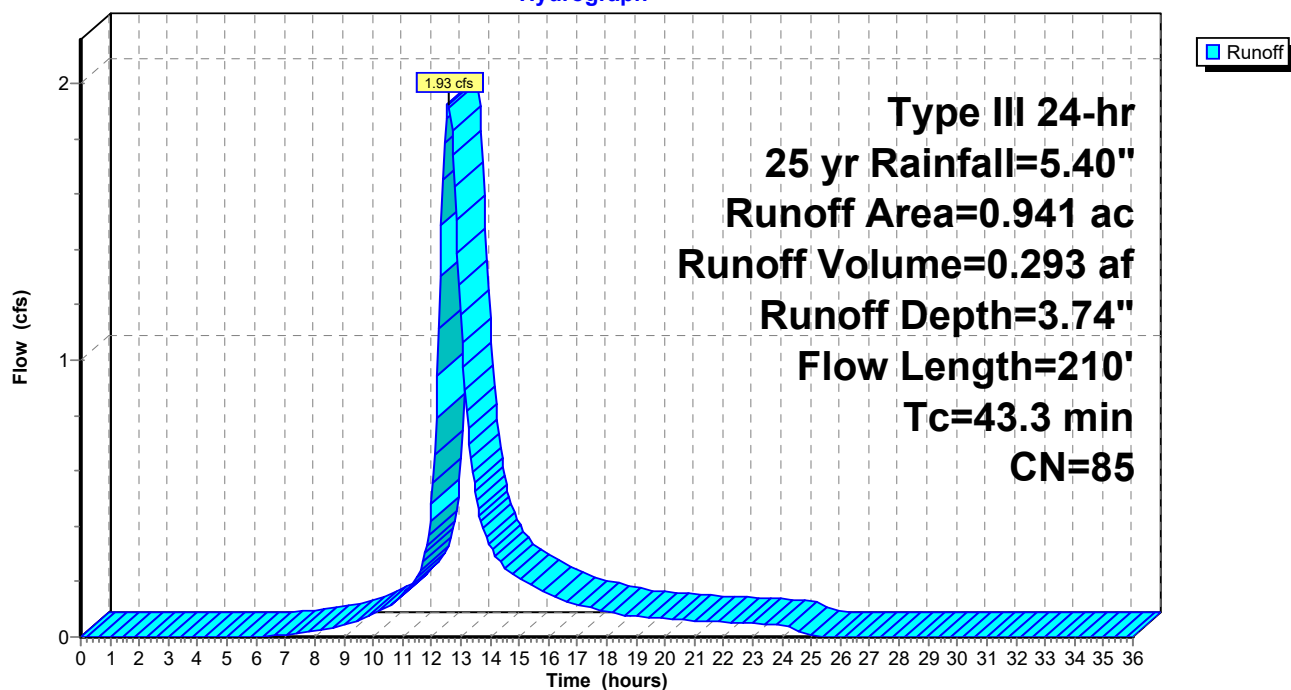
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
* 0.941	85	SYNTHETIC TURF- PAD- LINER
0.941		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	110	0.0055	0.05		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
43.3	210	Total			

Subcatchment PR-4A: PR-5A

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-4B: SB 11 A

Runoff = 1.93 cfs @ 12.51 hrs, Volume= 0.272 af, Depth= 3.74"

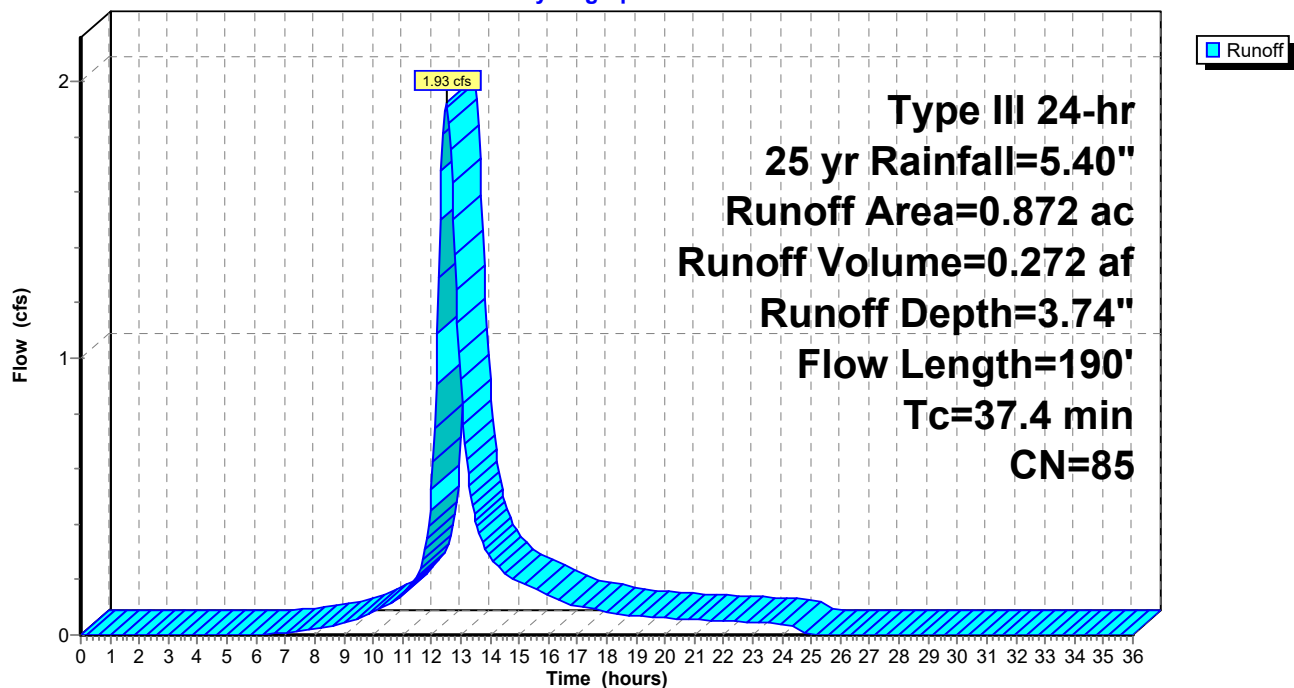
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Description
* 0.872	85	SYNTHETIC TURF- PAD- LINER
0.872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.7	90	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
37.4	190	Total			

Subcatchment PR-4B: SB 11 A

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Subcatchment PR-4C: SB 00 DPW SLOPE

Runoff = 0.23 cfs @ 12.10 hrs, Volume= 0.017 af, Depth= 1.93"

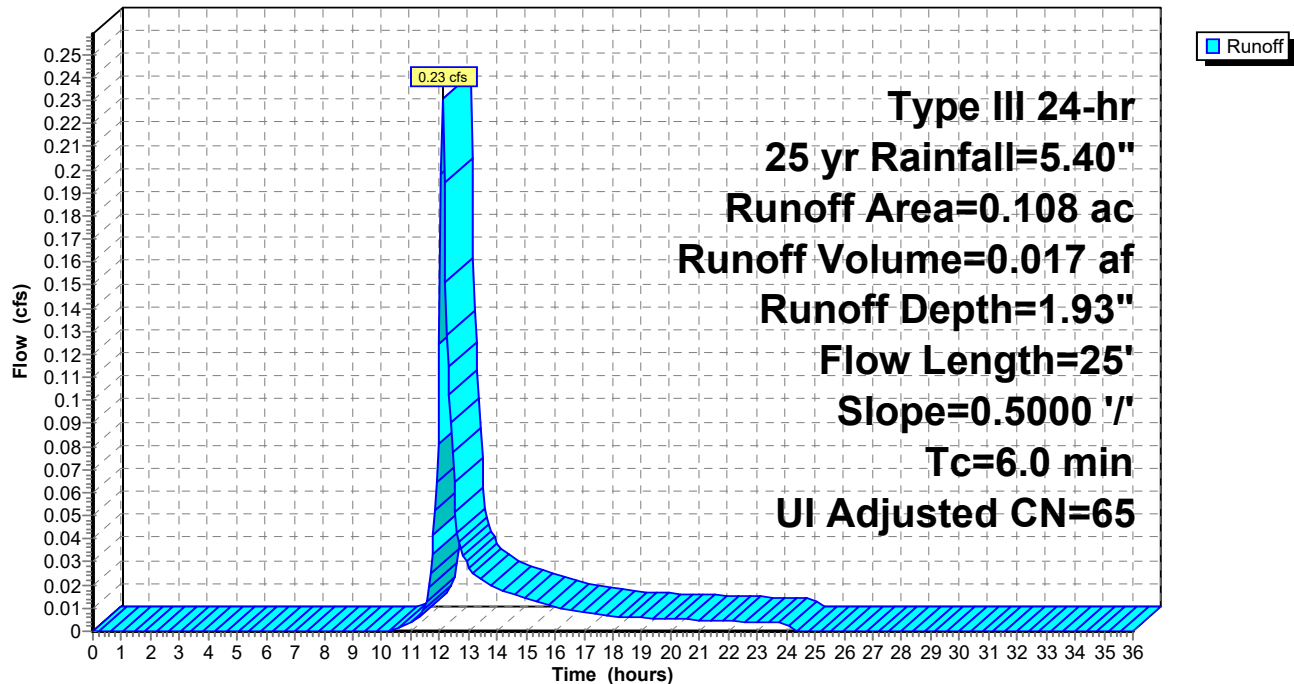
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (ac)	CN	Adj	Description
0.025	98		Unconnected pavement, HSG B
0.083	61		>75% Grass cover, Good, HSG B
0.108	70	65	Weighted Average, UI Adjusted
0.083			76.85% Pervious Area
0.025			23.15% Impervious Area
0.025			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	25	0.5000	0.32		Sheet Flow, SLOPING LAND
					Grass: Dense n= 0.240 P2= 3.20"
1.3	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-4C: SB 00 DPW SLOPE

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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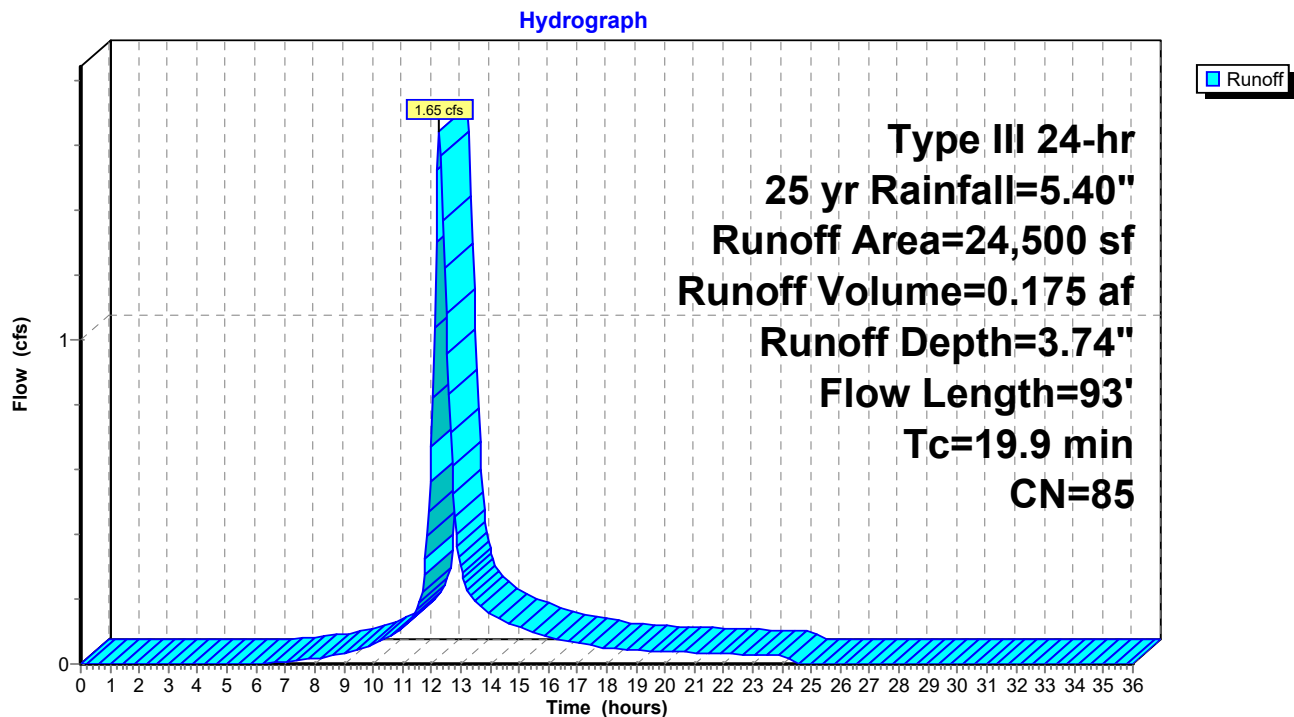
Summary for Subcatchment PR-5A: BB 01 A

Runoff = 1.65 cfs @ 12.27 hrs, Volume= 0.175 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (sf)	CN	Description
* 24,500	85	SYNTHETIC TURF- PAD- LINER
24,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	46	0.0067	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
19.9	93	Total			

Subcatchment PR-5A: BB 01 A

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Type III 24-hr 25 yr Rainfall=5.40"

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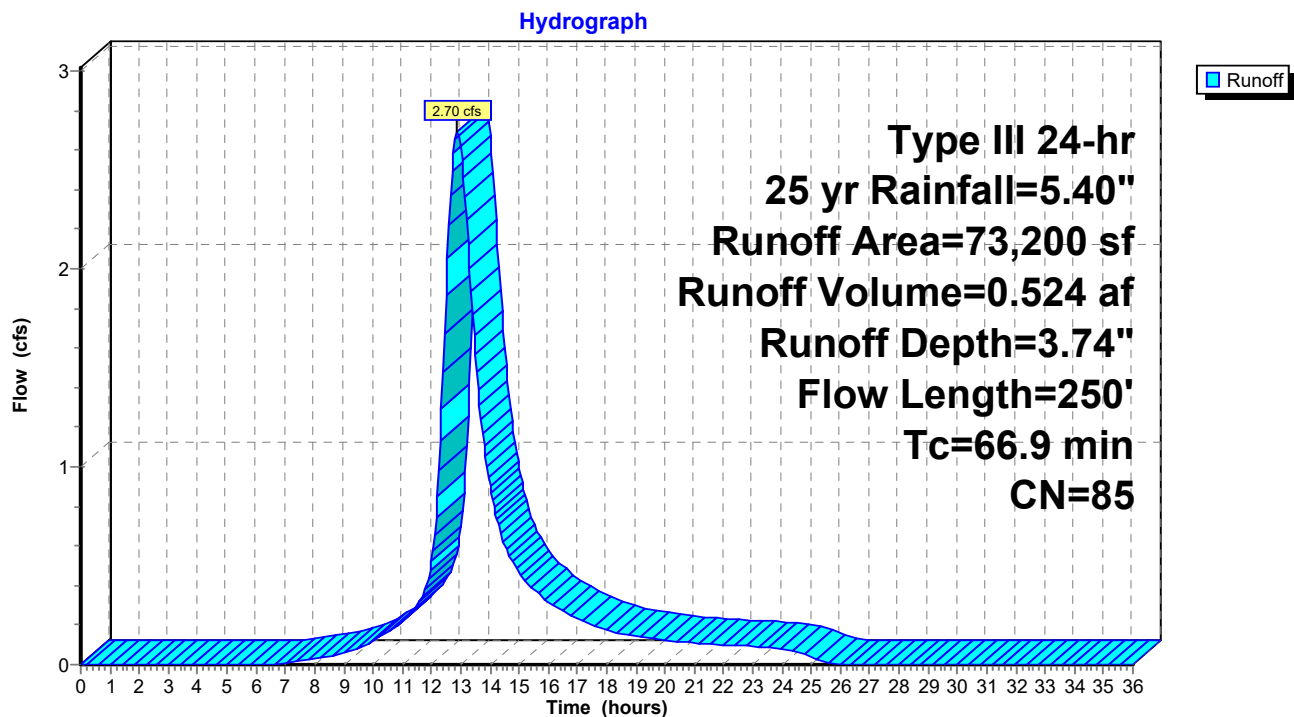
Summary for Subcatchment PR-5B: BB 11 A

Runoff = 2.70 cfs @ 12.87 hrs, Volume= 0.524 af, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
*	73,200	85	SYNTHETIC TURF- PAD- LINER
	73,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.1	53	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
43.1	150	0.0083	0.06		Sheet Flow, SYNTHETIC TURF Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
66.9	250	Total			

Subcatchment PR-5B: BB 11 A

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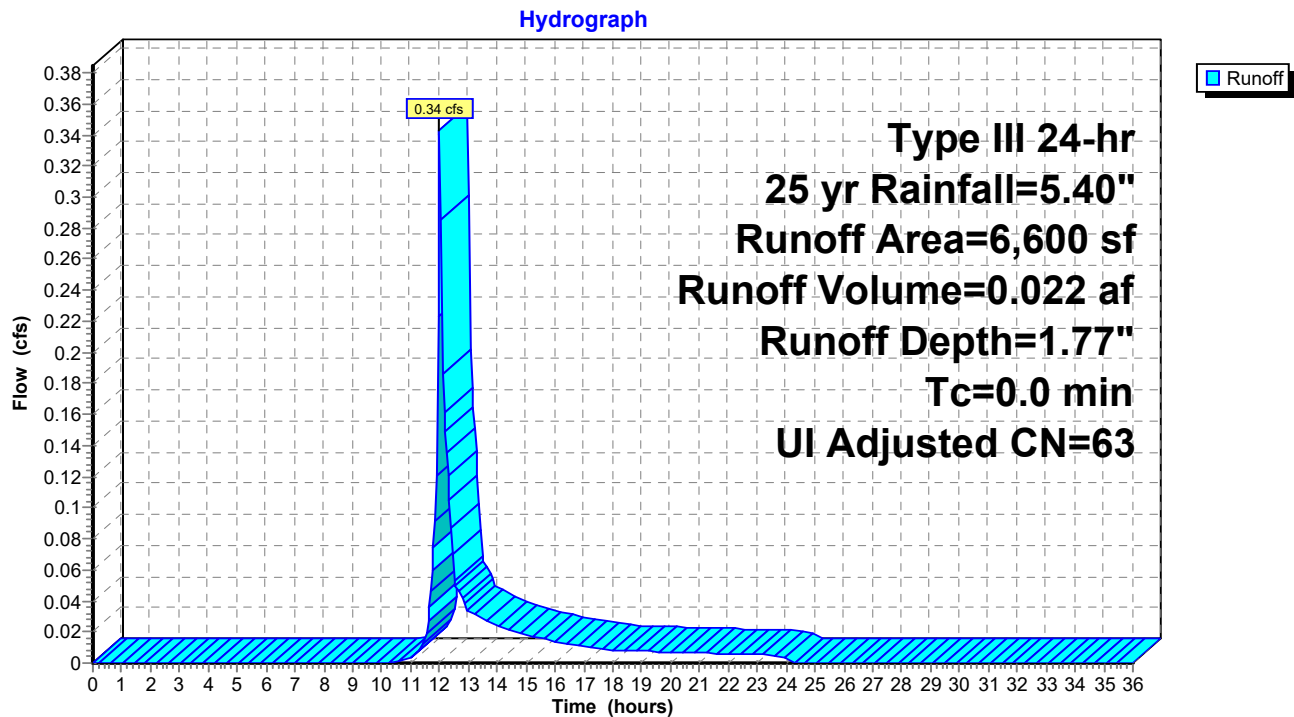
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Summary for Subcatchment PR-5C: SLOPE

Runoff = 0.34 cfs @ 12.01 hrs, Volume= 0.022 af, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (sf)	CN	Adj	Description
600	98		Unconnected roofs, HSG B
6,000	61		>75% Grass cover, Good, HSG B
6,600	64	63	Weighted Average, UI Adjusted
6,000			90.91% Pervious Area
600			9.09% Impervious Area
600			100.00% Unconnected

Subcatchment PR-5C: SLOPE

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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond 1P: rain garden#1 cascading

Inflow Area = 0.725 ac, 65.66% Impervious, Inflow Depth = 3.74" for 25 yr event
 Inflow = 3.07 cfs @ 12.09 hrs, Volume= 0.226 af
 Outflow = 2.85 cfs @ 12.11 hrs, Volume= 0.224 af, Atten= 7%, Lag= 1.4 min
 Primary = 2.75 cfs @ 12.12 hrs, Volume= 0.223 af
 Secondary = 0.11 cfs @ 12.10 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 62.02' @ 12.12 hrs Surf.Area= 507 sf Storage= 563 cf

Flood Elev= 63.00' Surf.Area= 660 sf Storage= 1,132 cf

Plug-Flow detention time= 39.9 min calculated for 0.224 af (99% of inflow)

Center-of-Mass det. time= 35.5 min (840.1 - 804.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,048 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 1,348 cf Overall - 300 cf Embedded = 1,048 cf
#2	58.50'	30 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 75 cf Overall x 40.0% Voids
#3	59.00'	50 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 199 cf Overall x 25.0% Voids
#4	60.33'	5 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 26 cf Overall x 20.0% Voids
1,132 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
60.50	150	300	300
61.00	236	97	397
62.00	503	370	766
63.00	660	582	1,348

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
59.00	150	75	75

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	150	0	0
60.33	150	199	199

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.33	150	0	0
60.50	150	26	26

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Type III 24-hr 25 yr Rainfall=5.40"

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Device	Routing	Invert	Outlet Devices
#1	Device 3	58.50'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	62.00'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	58.50'	8.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 58.50' / 58.40' S= 0.0050 ' / Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Device 3	61.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.71 cfs @ 12.12 hrs HW=62.01' TW=54.38' (Dynamic Tailwater)

← **3=Culvert** (Passes 2.71 cfs of 3.00 cfs potential flow)

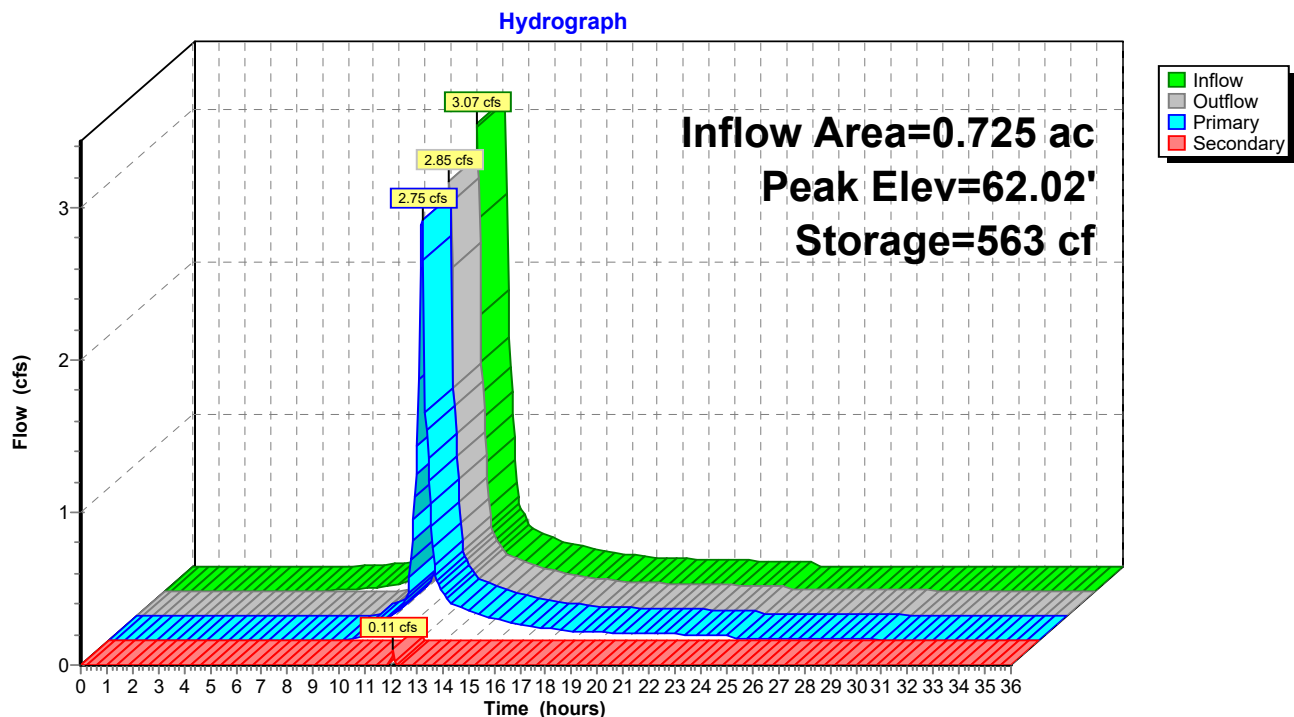
← **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

← **4=Orifice/Grate** (Orifice Controls 2.70 cfs @ 3.44 fps)

Secondary OutFlow Max=0.10 cfs @ 12.10 hrs HW=62.01' TW=54.35' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.29 fps)

Pond 1P: rain garden#1 cascading



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond 2P: rain garden#2 cascading

Inflow Area = 0.966 ac, 61.39% Impervious, Inflow Depth > 3.57" for 25 yr event
 Inflow = 3.71 cfs @ 12.11 hrs, Volume= 0.287 af
 Outflow = 3.19 cfs @ 12.17 hrs, Volume= 0.280 af, Atten= 14%, Lag= 3.9 min
 Primary = 3.19 cfs @ 12.17 hrs, Volume= 0.280 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 54.45' @ 12.17 hrs Surf.Area= 978 sf Storage= 1,150 cf

Flood Elev= 55.00' Surf.Area= 1,326 sf Storage= 1,784 cf

Plug-Flow detention time= 58.3 min calculated for 0.280 af (97% of inflow)

Center-of-Mass det. time= 37.4 min (873.3 - 835.9)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,557 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 2,357 cf Overall - 800 cf Embedded = 1,557 cf
#2	51.00'	80 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 200 cf Overall x 40.0% Voids
#3	51.50'	133 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 532 cf Overall x 25.0% Voids
#4	52.83'	14 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 68 cf Overall x 20.0% Voids
		1,784 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
53.00	400	800	800
54.00	694	547	1,347
55.00	1,326	1,010	2,357

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
51.50	400	200	200

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.50	400	0	0
52.83	400	532	532

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.83	400	0	0
53.00	400	68	68

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Type III 24-hr 25 yr Rainfall=5.40"

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Device	Routing	Invert	Outlet Devices
#1	Device 3	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	54.50'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	51.00'	12.0" Round Culvert L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 51.00' / 50.88' S= 0.0048 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Device 3	53.75'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.16 cfs @ 12.17 hrs HW=54.44' TW=48.95' (Dynamic Tailwater)

← **3=Culvert** (Passes 3.16 cfs of 6.48 cfs potential flow)

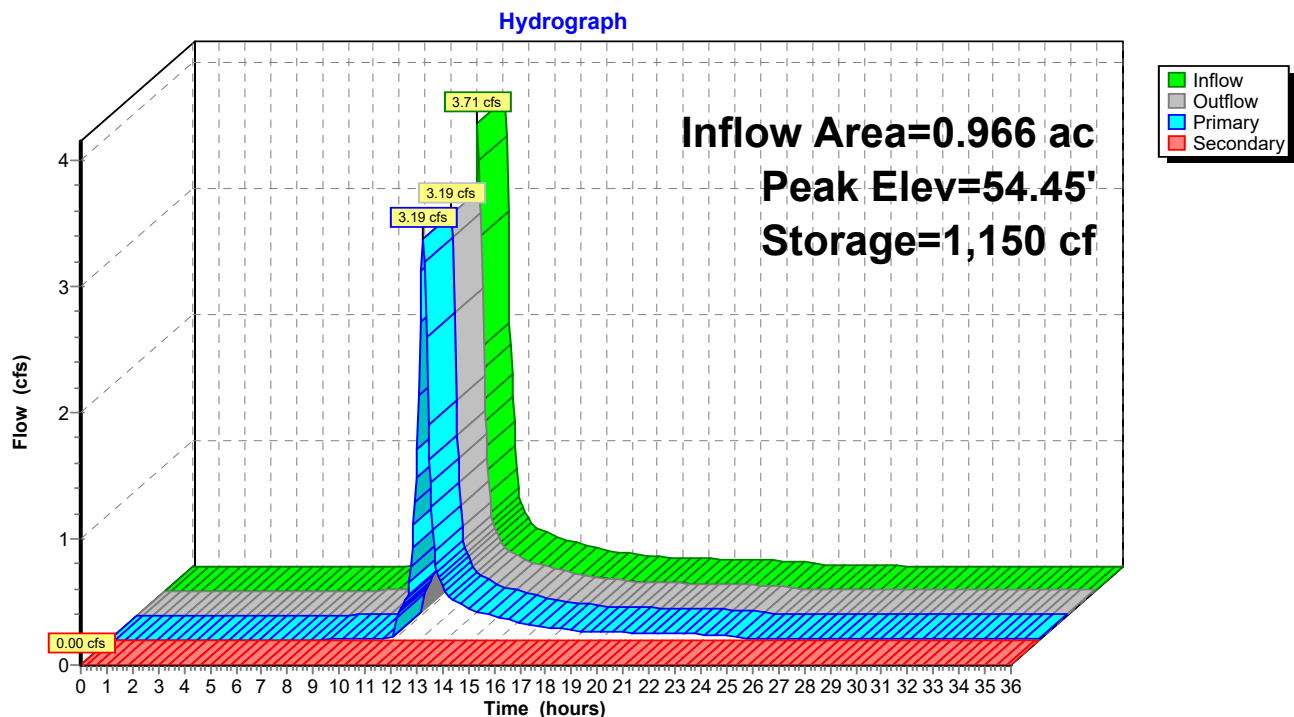
← **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

← **4=Orifice/Grate** (Orifice Controls 3.13 cfs @ 3.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=51.00' TW=46.00' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: rain garden#2 cascading



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Summary for Pond 3P: rain garden#3 cascading

Inflow Area = 1.153 ac, 51.43% Impervious, Inflow Depth > 3.18" for 25 yr event
 Inflow = 3.45 cfs @ 12.16 hrs, Volume= 0.305 af
 Outflow = 3.44 cfs @ 12.17 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.6 min
 Primary = 3.44 cfs @ 12.17 hrs, Volume= 0.291 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 48.95' @ 12.17 hrs Surf.Area= 938 sf Storage= 1,068 cf

Flood Elev= 50.00' Surf.Area= 1,373 sf Storage= 2,283 cf

Plug-Flow detention time= 76.4 min calculated for 0.290 af (95% of inflow)

Center-of-Mass det. time= 34.2 min (906.9 - 872.8)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	1,944 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 3,144 cf Overall - 1,200 cf Embedded = 1,944 cf
#2	46.00'	120 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 300 cf Overall x 40.0% Voids
#3	46.50'	199 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 798 cf Overall x 25.0% Voids
#4	47.83'	20 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 102 cf Overall x 20.0% Voids
		2,283 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
48.00	600	1,200	1,200
49.00	957	779	1,979
50.00	1,373	1,165	3,144

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
46.50	600	300	300

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.50	600	0	0
47.83	600	798	798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.83	600	0	0
48.00	600	102	102

Device	Routing	Invert	Outlet Devices
#1	Device 3	46.00'	1.020 in/hr Exfiltration over Surface area
#2	Device 3	48.75'	24.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

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Type III 24-hr 25 yr Rainfall=5.40"

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#3 Primary

46.00' 15.0" Round Culvert

L= 26.0' CPP, projecting, no headwall, $K_e = 0.900$

Inlet / Outlet Invert= 46.00' / 45.87' S= 0.0050 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.41 cfs @ 12.17 hrs HW=48.95' TW=0.00' (Dynamic Tailwater)

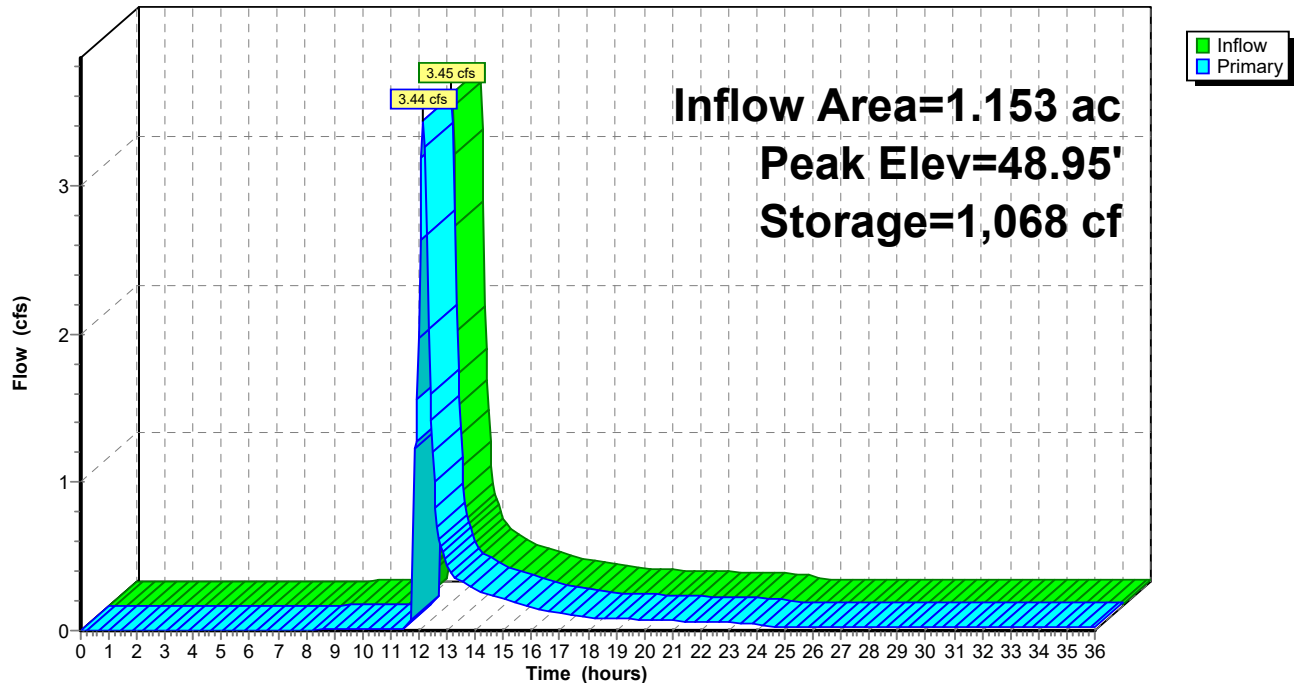
3=Culvert (Passes 3.41 cfs of 7.11 cfs potential flow)

1=Exfiltration (Exfiltration Controls 0.02 cfs)

2=Orifice/Grate (Weir Controls 3.39 cfs @ 1.45 fps)

Pond 3P: rain garden#3 cascading

Hydrograph



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Summary for Pond 4P: UGS-1

Inflow Area = 1.685 ac, 60.12% Impervious, Inflow Depth = 3.61" for 25 yr event
 Inflow = 6.78 cfs @ 12.09 hrs, Volume= 0.507 af
 Outflow = 5.39 cfs @ 12.16 hrs, Volume= 0.487 af, Atten= 21%, Lag= 4.0 min
 Discarded = 0.04 cfs @ 8.30 hrs, Volume= 0.101 af
 Primary = 5.35 cfs @ 12.16 hrs, Volume= 0.386 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 43.29' @ 12.16 hrs Surf.Area= 1,672 sf Storage= 4,180 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 104.6 min (905.8 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	39.50'	2,099 cf	29.92'W x 55.89'L x 5.50'H Field A 9,196 cf Overall - 3,198 cf Embedded = 5,998 cf x 35.0% Voids
#2A	40.25'	3,198 cf	ADS_StormTech MC-3500 d +Capx 28 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 28 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		5,297 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	39.50'	24.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 39.50' / 39.00' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	43.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Discarded	39.50'	1.020 in/hr Exfiltration over Surface area
#4	Device 1	41.83'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.04 cfs @ 8.30 hrs HW=39.56' (Free Discharge)↑ **3=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=5.31 cfs @ 12.16 hrs HW=43.27' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 5.31 cfs of 25.19 cfs potential flow)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)↑ **4=Orifice/Grate** (Orifice Controls 5.31 cfs @ 5.07 fps)

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Type III 24-hr 25 yr Rainfall=5.40"

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Pond 4P: UGS-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)

Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf

Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap

Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length

4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width

9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

28 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 4 Rows = 3,197.9 cf Chamber Storage

9,196.2 cf Field - 3,197.9 cf Chambers = 5,998.4 cf Stone x 35.0% Voids = 2,099.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,297.3 cf = 0.122 af

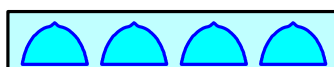
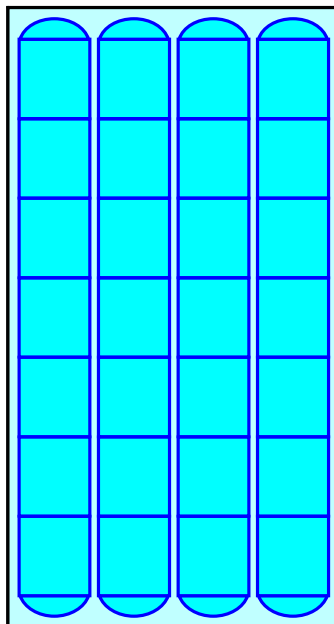
Overall Storage Efficiency = 57.6%

Overall System Size = 55.89' x 29.92' x 5.50'

28 Chambers

340.6 cy Field

222.2 cy Stone



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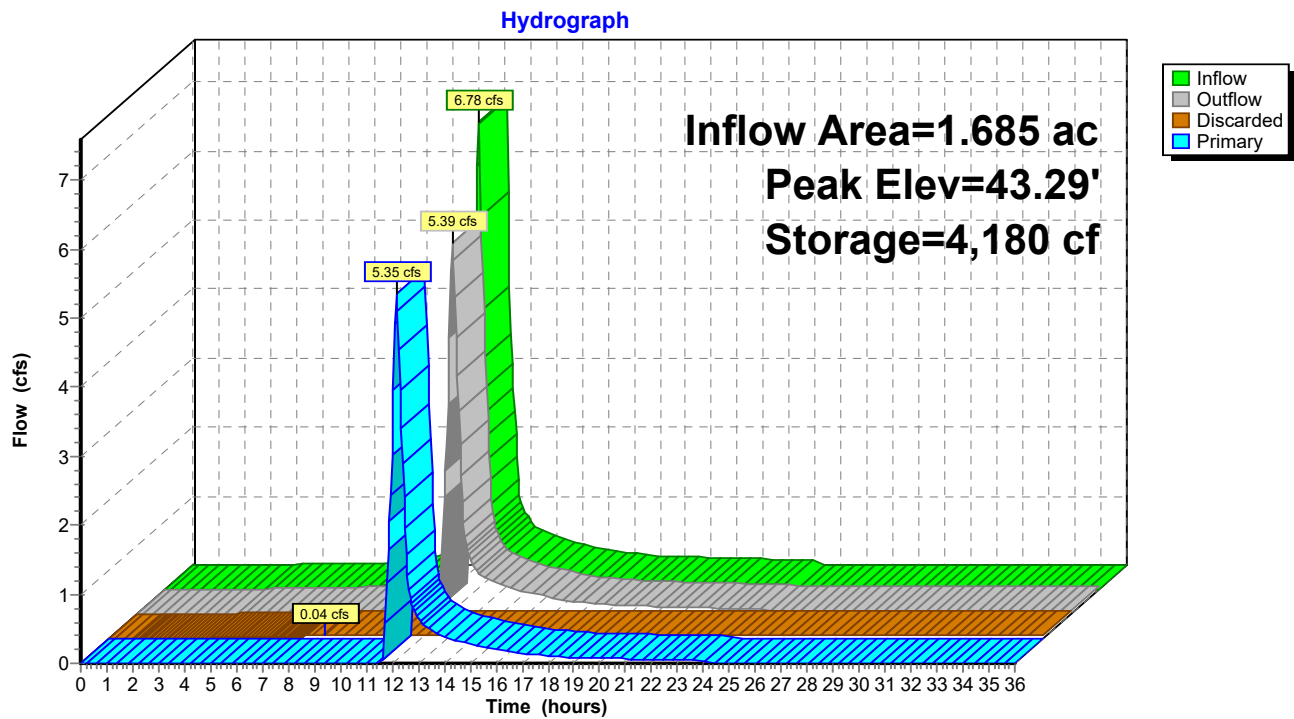
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Type III 24-hr 25 yr Rainfall=5.40"

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Pond 4P: UGS-1



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond BB 01 B: BB 01 B

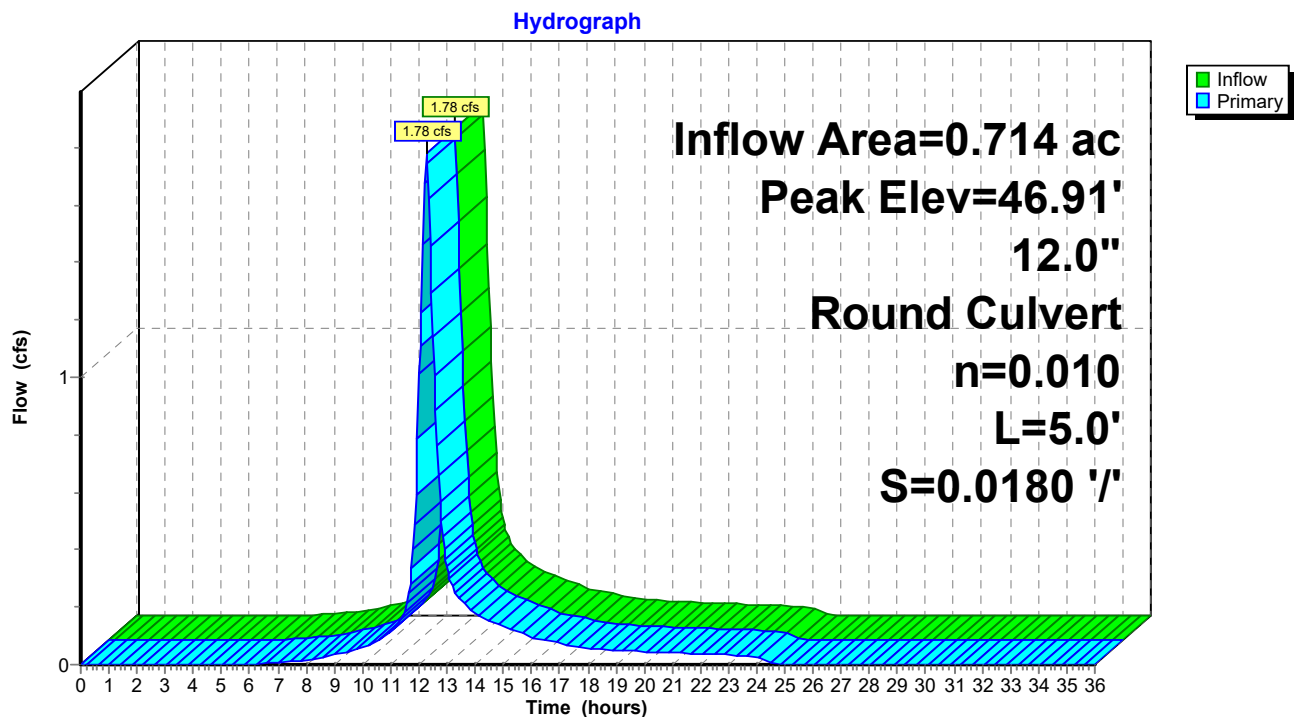
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 3.32" for 25 yr event
Inflow = 1.78 cfs @ 12.26 hrs, Volume= 0.198 af
Outflow = 1.78 cfs @ 12.26 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min
Primary = 1.78 cfs @ 12.26 hrs, Volume= 0.198 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.91' @ 12.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	12.0" Round Culvert L= 5.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.81' S= 0.0180 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.26 hrs HW=46.72' TW=46.43' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 1.74 cfs @ 3.43 fps)

Pond BB 01 B: BB 01 B



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond BB 01 S: BB 01 S

Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 3.32" for 25 yr event
 Inflow = 1.78 cfs @ 12.26 hrs, Volume= 0.198 af
 Outflow = 0.91 cfs @ 12.59 hrs, Volume= 0.198 af, Atten= 49%, Lag= 19.5 min
 Primary = 0.91 cfs @ 12.59 hrs, Volume= 0.198 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 46.86' @ 12.59 hrs Surf.Area= 0 sf Storage= 2,045 cf

Plug-Flow detention time= 25.1 min calculated for 0.198 af (100% of inflow)
 Center-of-Mass det. time= 24.6 min (846.5 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	44.97'	3,256 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.97	0	0
45.30	16	16
45.80	236	252
46.30	825	1,077
46.80	876	1,953
47.30	792	2,745
47.80	511	3,256

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	4.0" Round Culvert L= 8.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 44.87' S= 0.0125 '/' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	46.40'	6.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.40' / 46.30' S= 0.0200 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf

Primary OutFlow Max=0.91 cfs @ 12.59 hrs HW=46.86' TW=45.46' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.50 cfs @ 5.69 fps)
 2=Culvert (Barrel Controls 0.41 cfs @ 2.86 fps)

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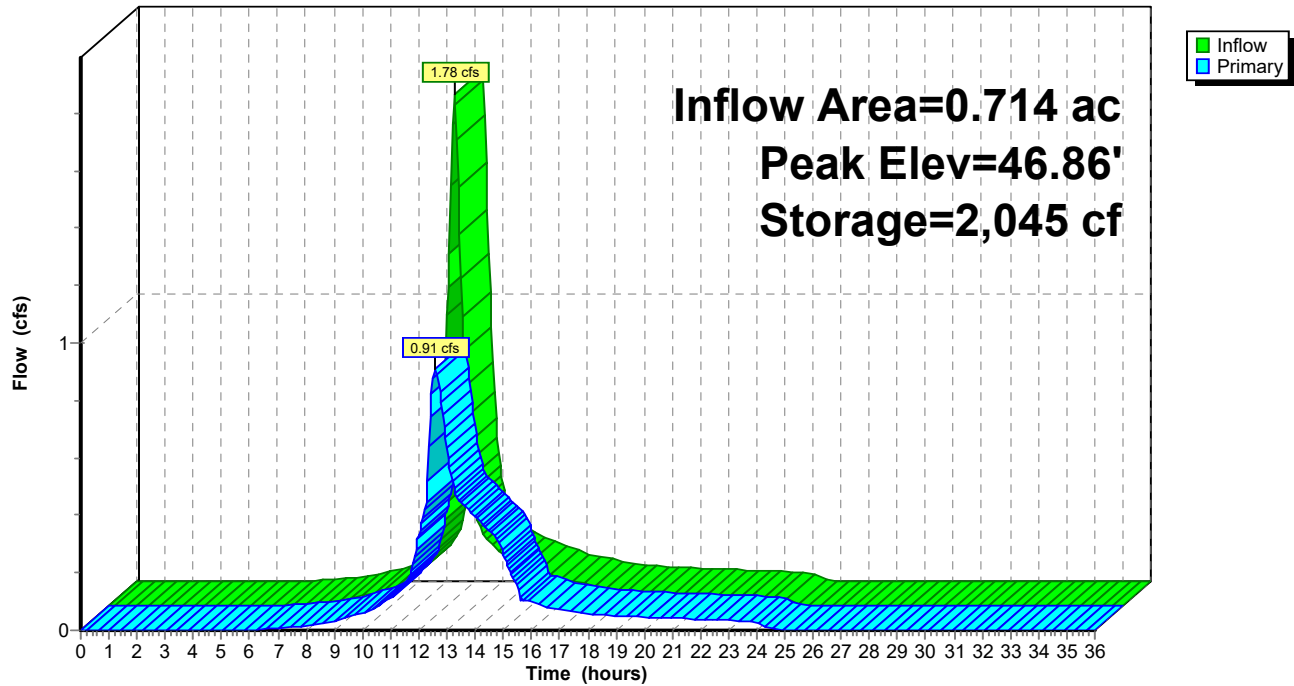
Type III 24-hr 25 yr Rainfall=5.40"

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Pond BB 01 S: BB 01 S

Hydrograph



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond BB 06 B: BB 06 B

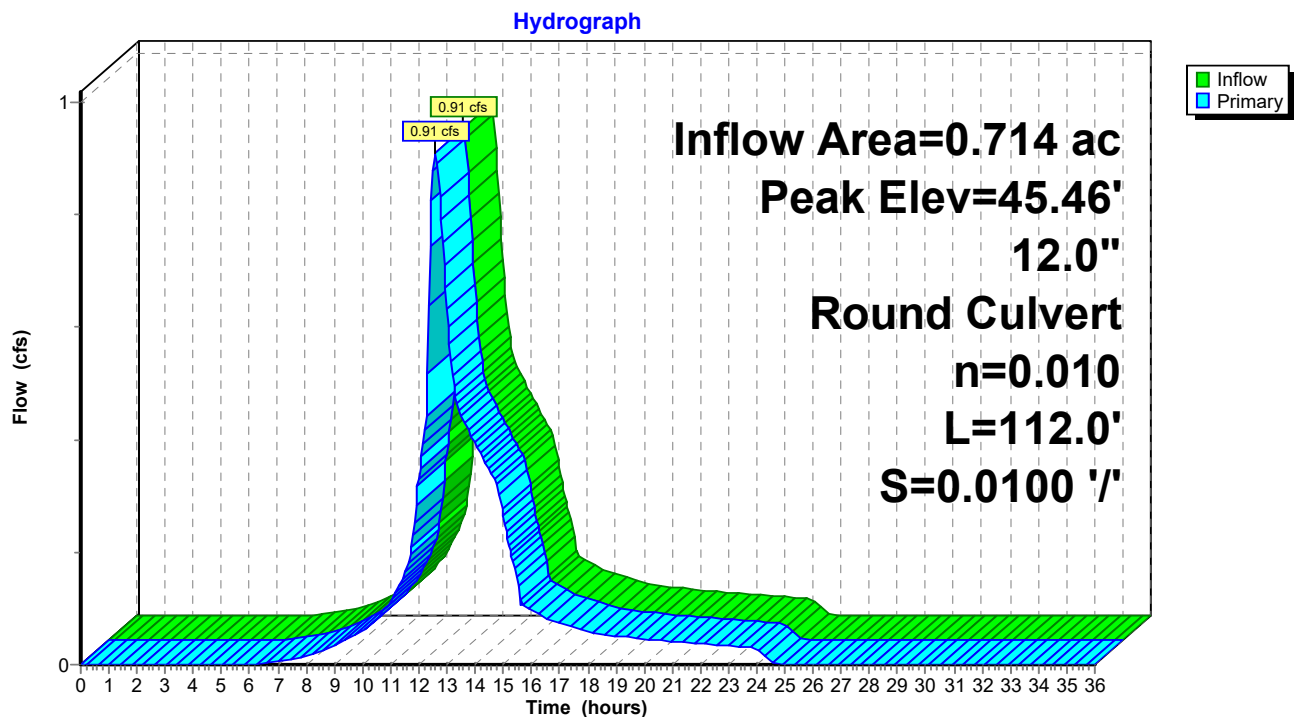
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 3.32" for 25 yr event
Inflow = 0.91 cfs @ 12.59 hrs, Volume= 0.198 af
Outflow = 0.91 cfs @ 12.59 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min
Primary = 0.91 cfs @ 12.59 hrs, Volume= 0.198 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 45.46' @ 12.59 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 43.85' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.91 cfs @ 12.59 hrs HW=45.46' TW=43.22' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 0.91 cfs @ 2.38 fps)

Pond BB 06 B: BB 06 B



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Summary for Pond BB 11 B: BB 11 B

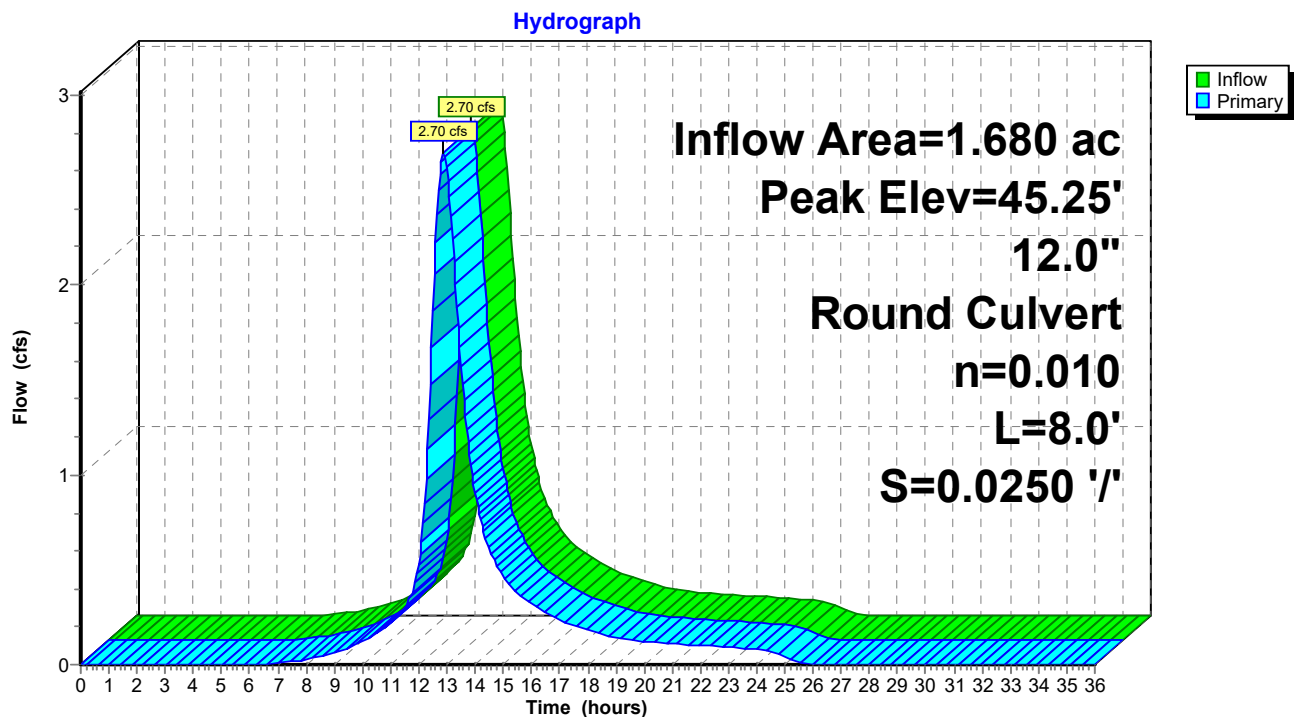
Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 3.74" for 25 yr event
Inflow = 2.70 cfs @ 12.87 hrs, Volume= 0.524 af
Outflow = 2.70 cfs @ 12.87 hrs, Volume= 0.524 af, Atten= 0%, Lag= 0.0 min
Primary = 2.70 cfs @ 12.87 hrs, Volume= 0.524 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 45.25' @ 13.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.00'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.00' / 43.80' S= 0.0250 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.57 cfs @ 12.87 hrs HW=45.01' TW=44.55' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.57 cfs @ 3.27 fps)

Pond BB 11 B: BB 11 B



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond BB 11 S: BB 11 S

Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 3.74" for 25 yr event
 Inflow = 2.70 cfs @ 12.87 hrs, Volume= 0.524 af
 Outflow = 2.14 cfs @ 13.24 hrs, Volume= 0.524 af, Atten= 21%, Lag= 22.4 min
 Primary = 2.14 cfs @ 13.24 hrs, Volume= 0.524 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 44.91' @ 13.24 hrs Surf.Area= 0 sf Storage= 2,716 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 10.0 min (871.0 - 861.0)

Volume	Invert	Avail.Storage	Storage Description
#1	42.97'	4,778 cf	Custom Stage Data Listed below

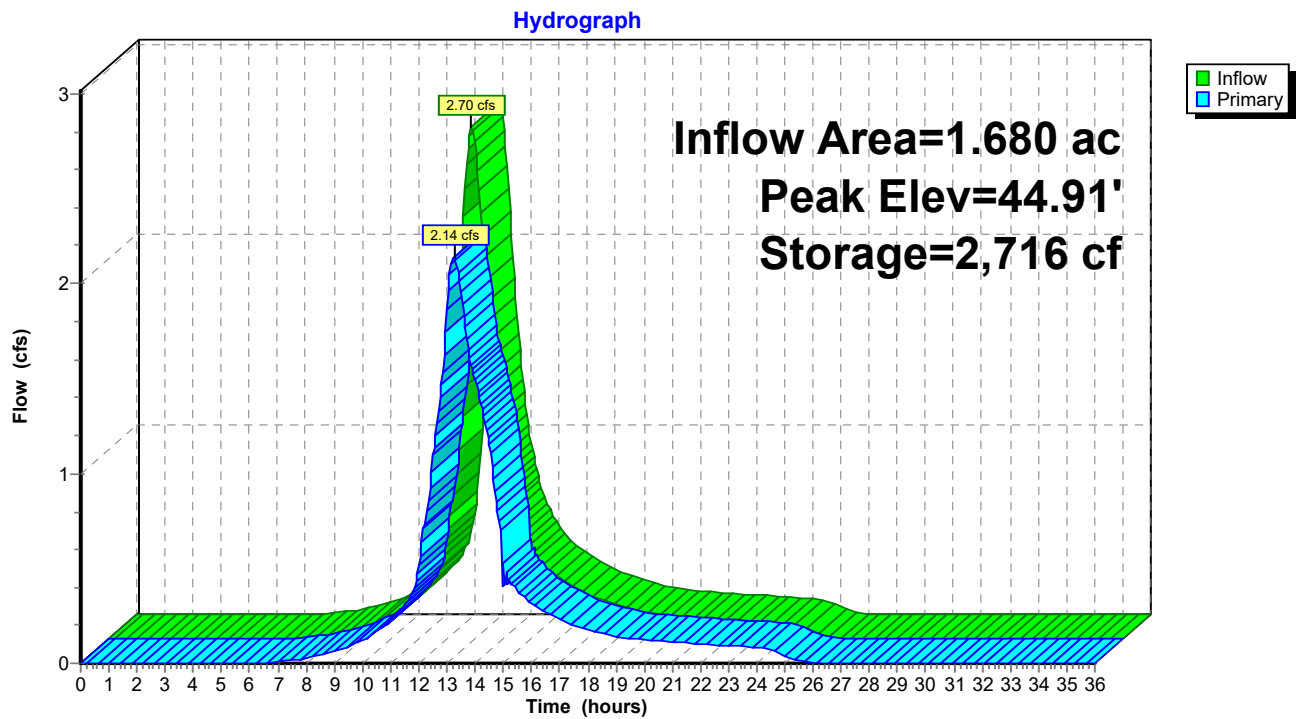
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.97	0	0
43.30	16	16
43.80	481	497
44.30	963	1,460
44.80	1,019	2,479
45.30	1,085	3,564
45.80	603	4,167
46.30	611	4,778

Device	Routing	Invert	Outlet Devices
#1	Primary	42.97'	4.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.97' / 42.81' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	39.70'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.70' / 39.60' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Primary	44.50'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.50' / 44.40' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=2.14 cfs @ 13.24 hrs HW=44.91' TW=43.32' (Dynamic Tailwater)

1=Culvert (Outlet Controls 0.53 cfs @ 6.06 fps)
 2=Culvert (Inlet Controls 1.19 cfs @ 6.07 fps)
 3=Culvert (Barrel Controls 0.42 cfs @ 2.71 fps)

Pond BB 11 S: BB 11 S



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond PR-4: PR-4

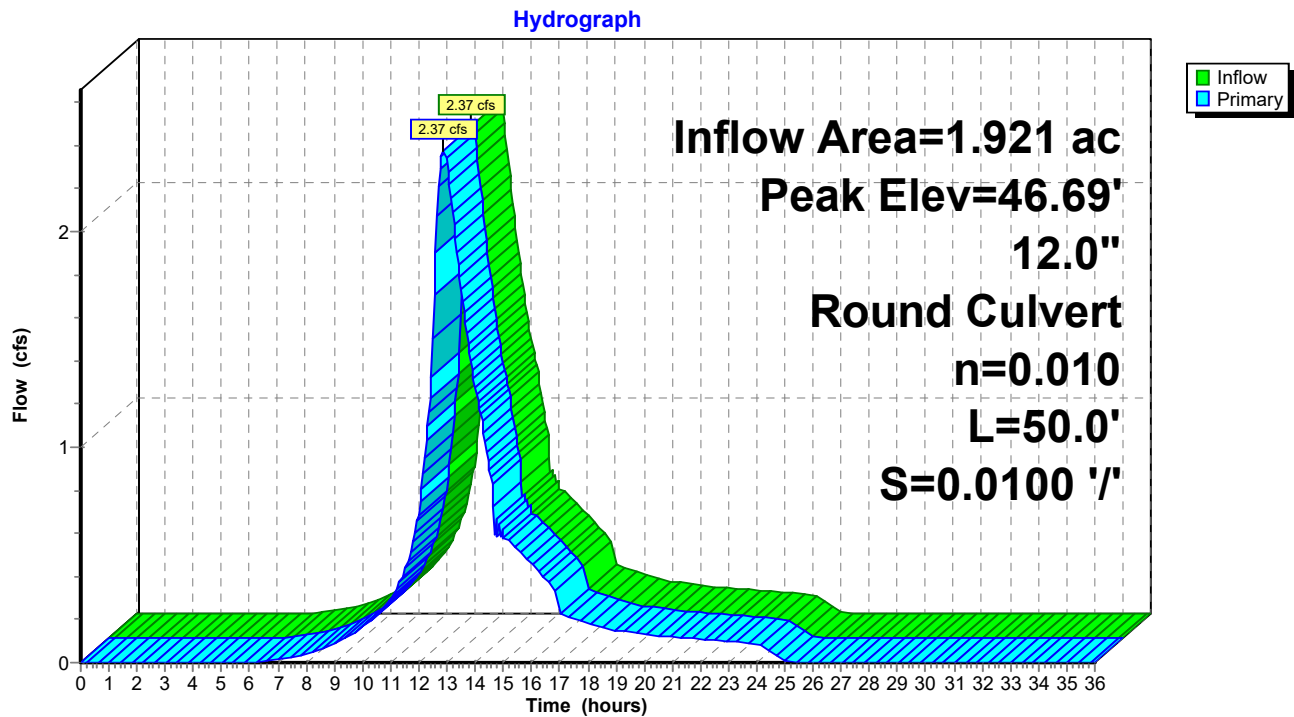
Inflow Area = 1.921 ac, 1.30% Impervious, Inflow Depth = 3.64" for 25 yr event
Inflow = 2.37 cfs @ 12.88 hrs, Volume= 0.582 af
Outflow = 2.37 cfs @ 12.88 hrs, Volume= 0.582 af, Atten= 0%, Lag= 0.0 min
Primary = 2.37 cfs @ 12.88 hrs, Volume= 0.582 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.69' @ 12.88 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.80'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.80' / 45.30' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.37 cfs @ 12.88 hrs HW=46.69' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.37 cfs @ 3.21 fps)

Pond PR-4: PR-4



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Summary for Pond PR-5: PR-5

Inflow Area = 2.394 ac, 0.58% Impervious, Inflow Depth = 3.61" for 25 yr event
Inflow = 2.65 cfs @ 13.19 hrs, Volume= 0.721 af
Outflow = 2.65 cfs @ 13.19 hrs, Volume= 0.721 af, Atten= 0%, Lag= 0.0 min
Primary = 2.65 cfs @ 13.19 hrs, Volume= 0.721 af

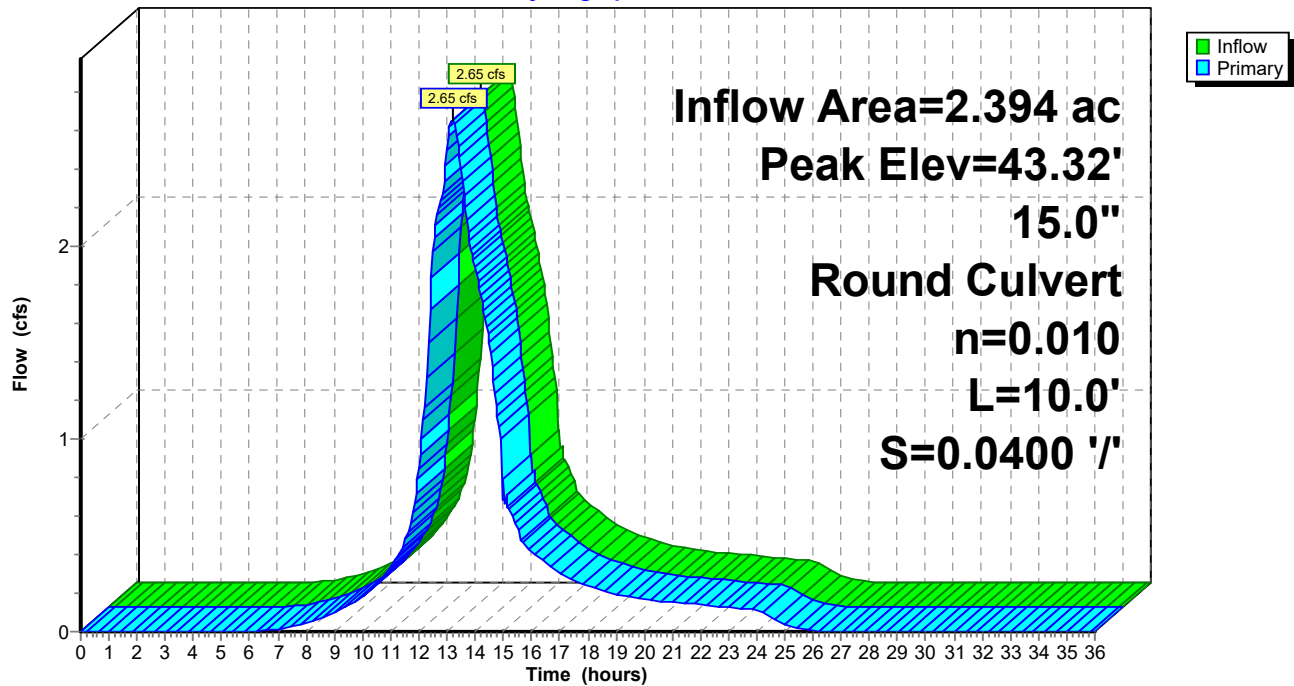
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 43.32' @ 13.19 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.10' S= 0.0400 '/ Cc= 0.900 n= 0.010, Flow Area= 1.23 sf

Primary OutFlow Max=2.65 cfs @ 13.19 hrs HW=43.32' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.65 cfs @ 3.09 fps)

Pond PR-5: PR-5

Hydrograph



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Summary for Pond SB 01 B: SB 01 B

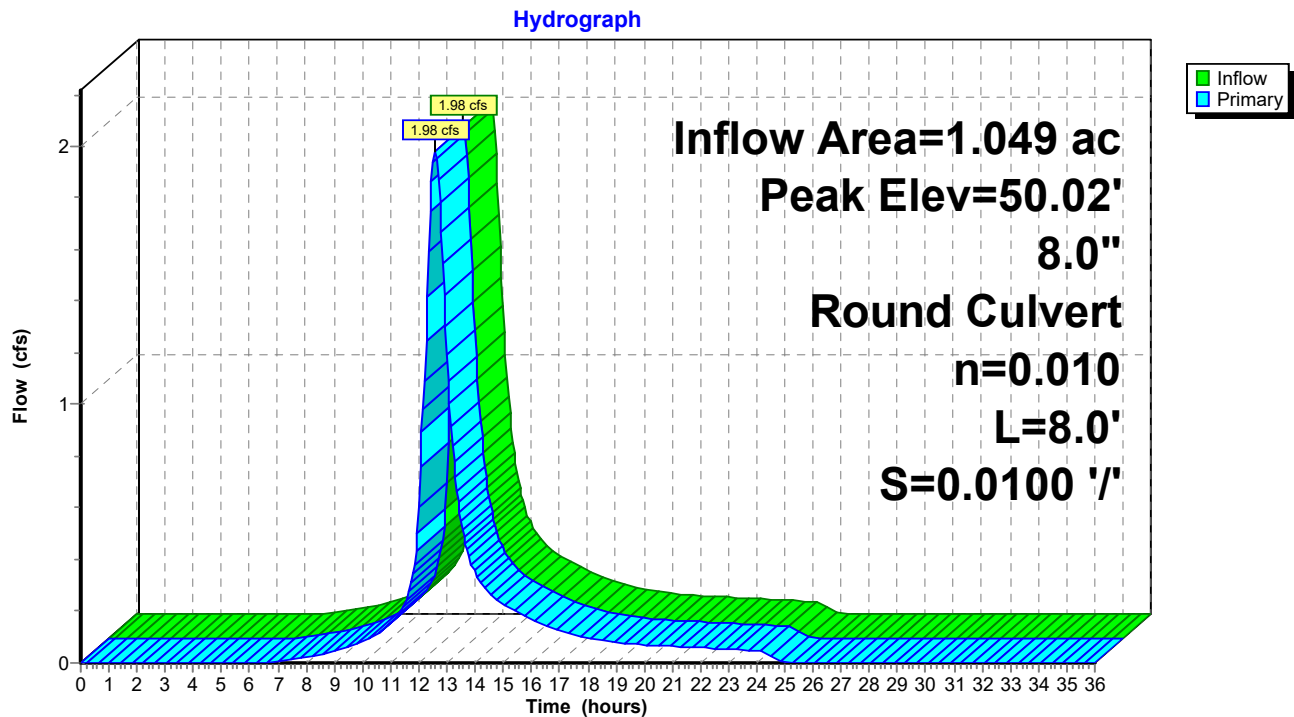
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 3.55" for 25 yr event
Inflow = 1.98 cfs @ 12.57 hrs, Volume= 0.311 af
Outflow = 1.98 cfs @ 12.57 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min
Primary = 1.98 cfs @ 12.57 hrs, Volume= 0.311 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 50.02' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.97 cfs @ 12.57 hrs HW=50.01' TW=47.87' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.97 cfs @ 5.65 fps)

Pond SB 01 B: SB 01 B



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond SB 01 S: SB 01 S

Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 3.55" for 25 yr event
 Inflow = 1.98 cfs @ 12.57 hrs, Volume= 0.311 af
 Outflow = 1.15 cfs @ 13.02 hrs, Volume= 0.311 af, Atten= 42%, Lag= 27.2 min
 Primary = 1.15 cfs @ 13.02 hrs, Volume= 0.311 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.37' @ 13.02 hrs Surf.Area= 0 sf Storage= 2,253 cf

Plug-Flow detention time= 13.8 min calculated for 0.310 af (100% of inflow)
 Center-of-Mass det. time= 13.8 min (853.9 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	46.30'	4,121 cf	Custom Stage Data Listed below

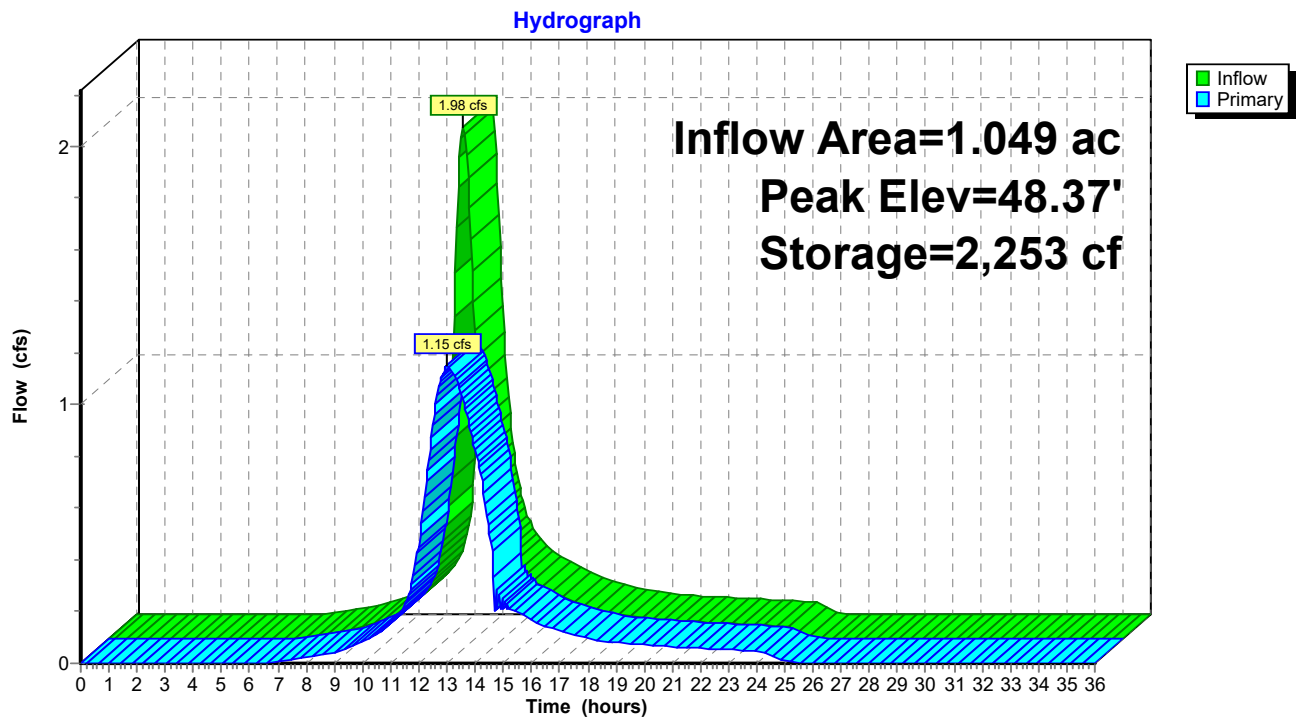
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.30	0	0
46.80	16	16
47.30	386	402
47.80	837	1,239
48.30	886	2,125
48.80	943	3,068
49.30	523	3,591
49.80	530	4,121

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.30' / 46.20' S= 0.0125 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 ' /' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.15 cfs @ 13.02 hrs HW=48.37' TW=46.91' (Dynamic Tailwater)

1=Culvert (Inlet Controls 1.14 cfs @ 5.80 fps)
 2=Culvert (Barrel Controls 0.02 cfs @ 1.28 fps)

Pond SB 01 S: SB 01 S



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Type III 24-hr 25 yr Rainfall=5.40"

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Summary for Pond SB 03 B: SB 03B

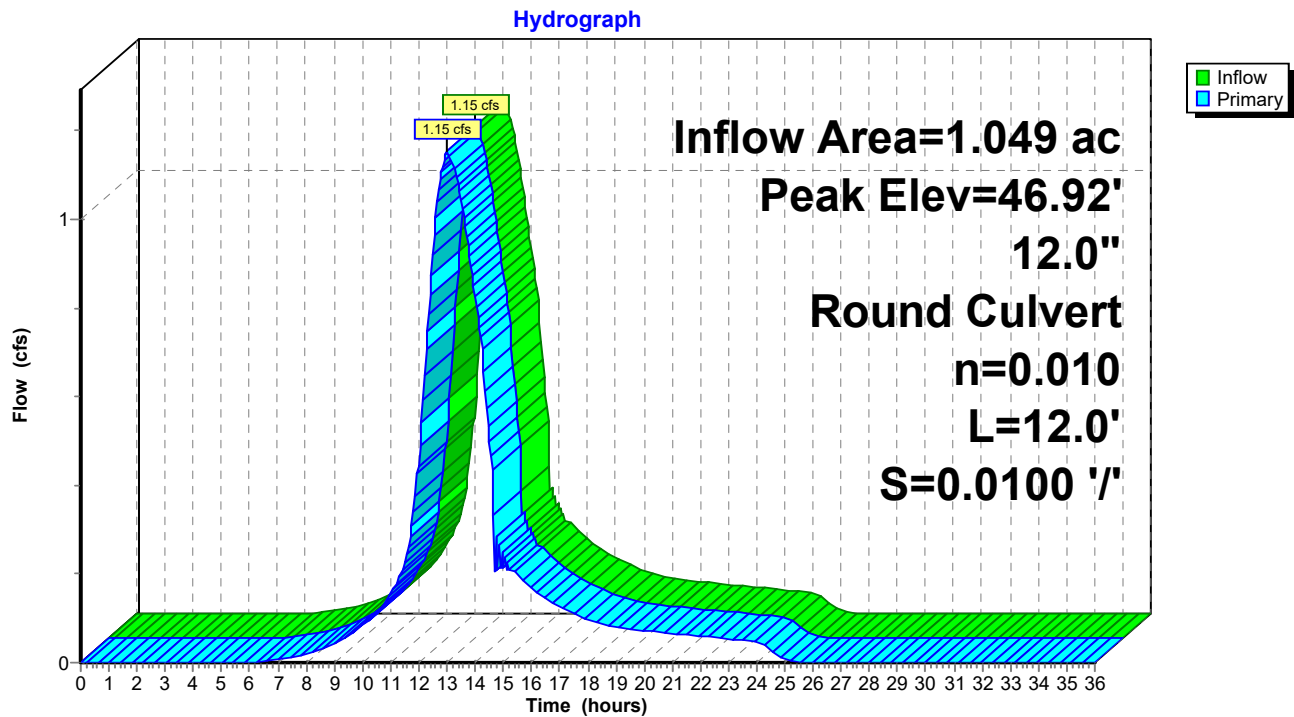
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 3.55" for 25 yr event
Inflow = 1.15 cfs @ 13.02 hrs, Volume= 0.311 af
Outflow = 1.15 cfs @ 13.02 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 13.02 hrs, Volume= 0.311 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.92' @ 12.96 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 46.13' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.18 cfs @ 13.02 hrs HW=46.91' TW=46.67' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.18 cfs @ 3.02 fps)

Pond SB 03 B: SB 03B



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Summary for Pond SB 11 B: SB 11 B

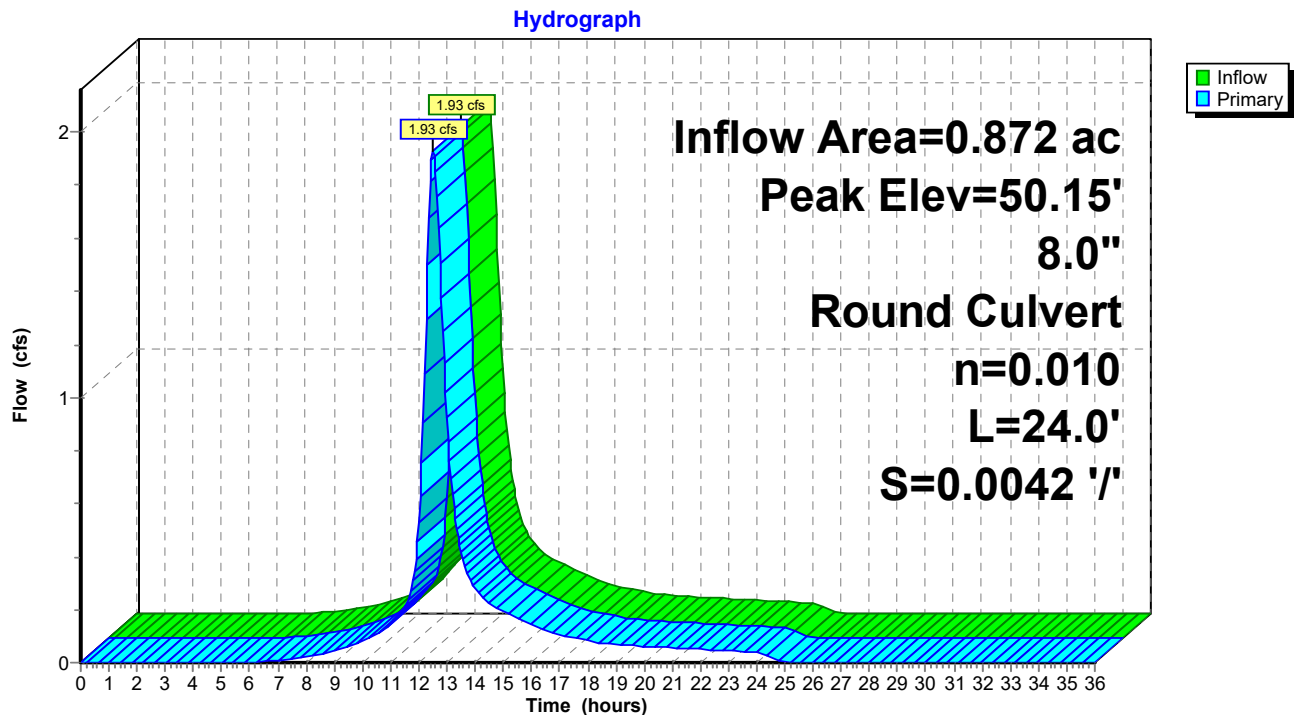
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 3.74" for 25 yr event
Inflow = 1.93 cfs @ 12.51 hrs, Volume= 0.272 af
Outflow = 1.93 cfs @ 12.51 hrs, Volume= 0.272 af, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 12.51 hrs, Volume= 0.272 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 50.15' @ 12.51 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	8.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.50' / 48.40' S= 0.0042 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.93 cfs @ 12.51 hrs HW=50.15' TW=48.32' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.93 cfs @ 5.52 fps)

Pond SB 11 B: SB 11 B



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Summary for Pond SB 11 S: SB 11 S

Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 3.74" for 25 yr event
 Inflow = 1.93 cfs @ 12.51 hrs, Volume= 0.272 af
 Outflow = 1.25 cfs @ 12.85 hrs, Volume= 0.272 af, Atten= 35%, Lag= 20.5 min
 Primary = 1.25 cfs @ 12.85 hrs, Volume= 0.272 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.70' @ 12.85 hrs Surf.Area= 0 sf Storage= 2,656 cf

Plug-Flow detention time= 30.8 min calculated for 0.271 af (100% of inflow)
 Center-of-Mass det. time= 30.8 min (864.5 - 833.7)

Volume	Invert	Avail.Storage	Storage Description
#1	46.80'	3,953 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.80	0	0
47.30	16	16
47.80	888	904
48.30	944	1,848
48.80	1,001	2,849
49.30	544	3,393
49.80	560	3,953

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	4.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 46.72' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	48.10'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.10' / 48.00' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.25 cfs @ 12.85 hrs HW=48.70' TW=47.45' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.47 cfs @ 5.39 fps)
 2=Culvert (Barrel Controls 0.78 cfs @ 3.08 fps)

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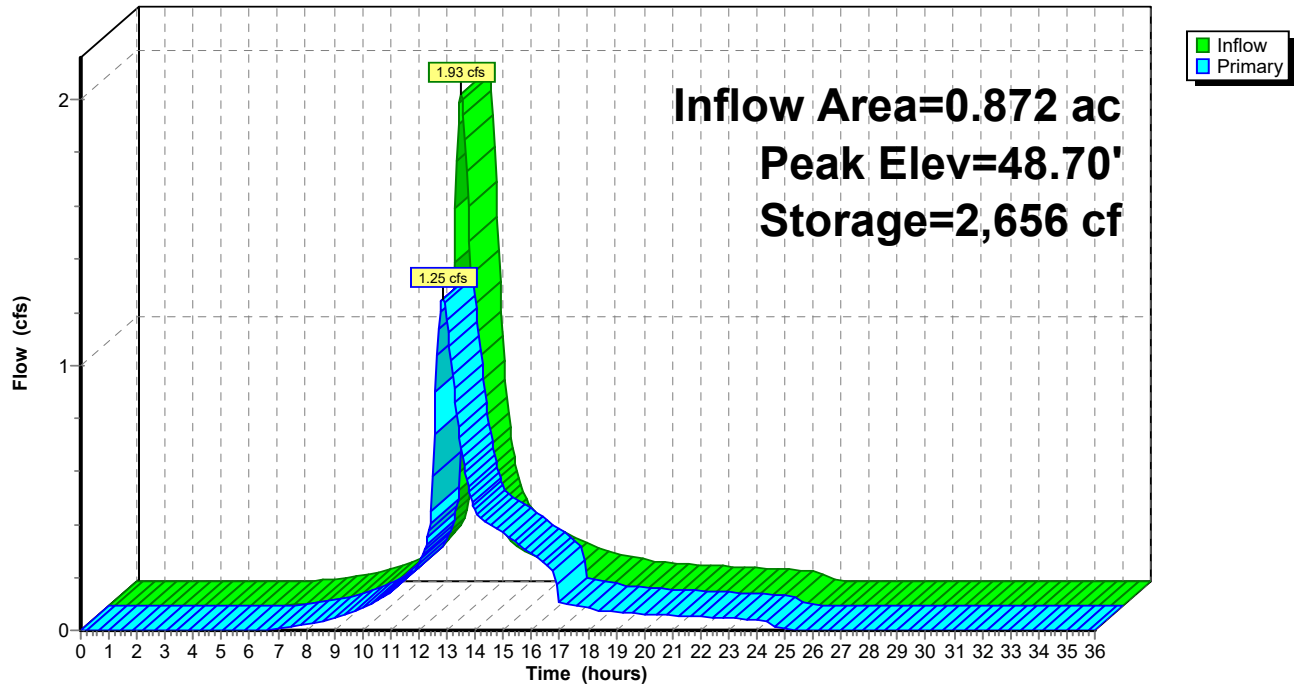
Type III 24-hr 25 yr Rainfall=5.40"

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Pond SB 11 S: SB 11 S

Hydrograph



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Summary for Pond SB 12 B: SB 12 B

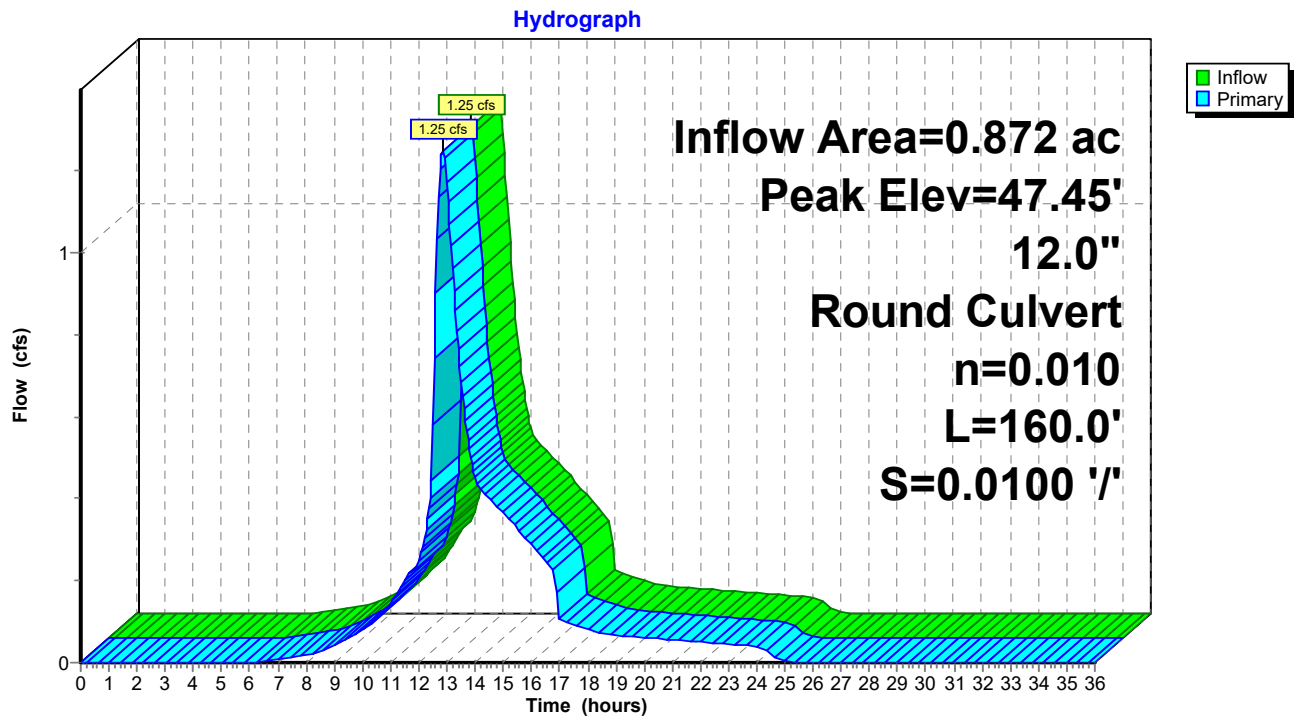
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 3.74" for 25 yr event
Inflow = 1.25 cfs @ 12.85 hrs, Volume= 0.272 af
Outflow = 1.25 cfs @ 12.85 hrs, Volume= 0.272 af, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.85 hrs, Volume= 0.272 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.45' @ 12.86 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	12.0" Round Culvert L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 45.20' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.24 cfs @ 12.85 hrs HW=47.45' TW=46.69' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 1.24 cfs @ 3.28 fps)

Pond SB 12 B: SB 12 B



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Type III 24-hr 25 yr Rainfall=5.40"

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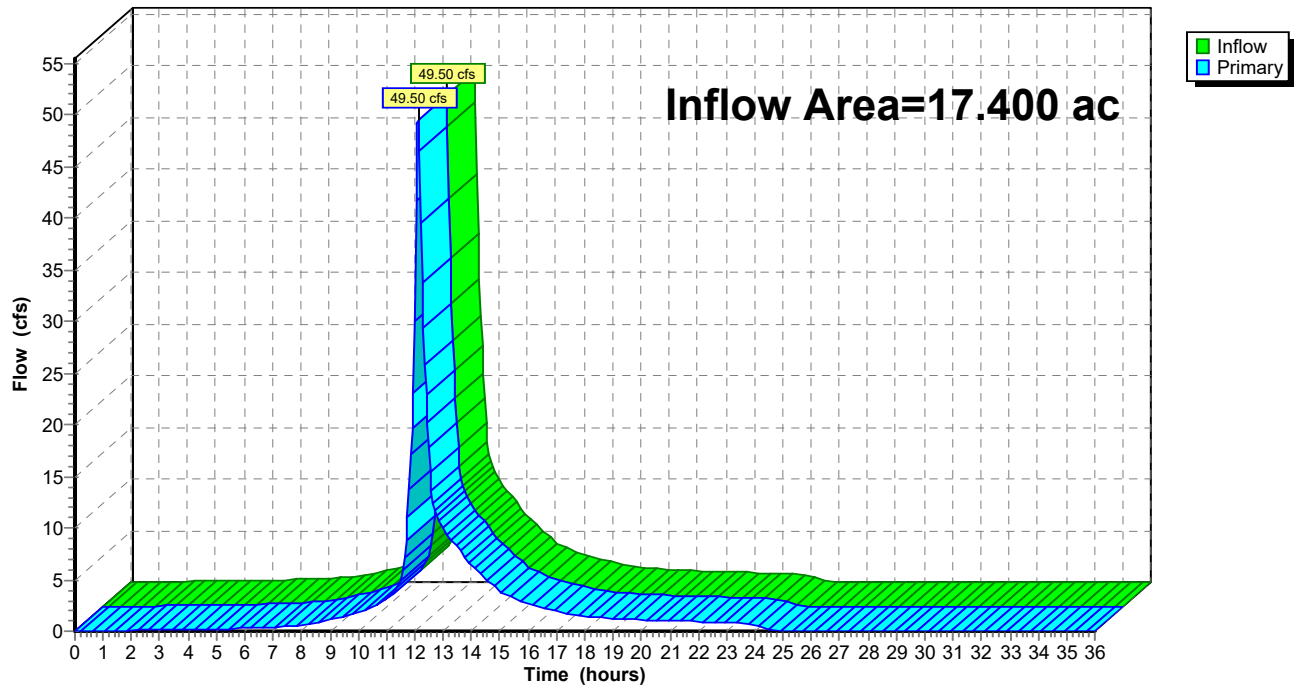
Summary for Link POA: POA

Inflow Area = 17.400 ac, 49.60% Impervious, Inflow Depth > 3.67" for 25 yr event
Inflow = 49.50 cfs @ 12.11 hrs, Volume= 5.318 af
Primary = 49.50 cfs @ 12.11 hrs, Volume= 5.318 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link POA: POA

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-1: PR-1

Runoff = 22.05 cfs @ 12.13 hrs, Volume= 1.803 af, Depth= 4.92"

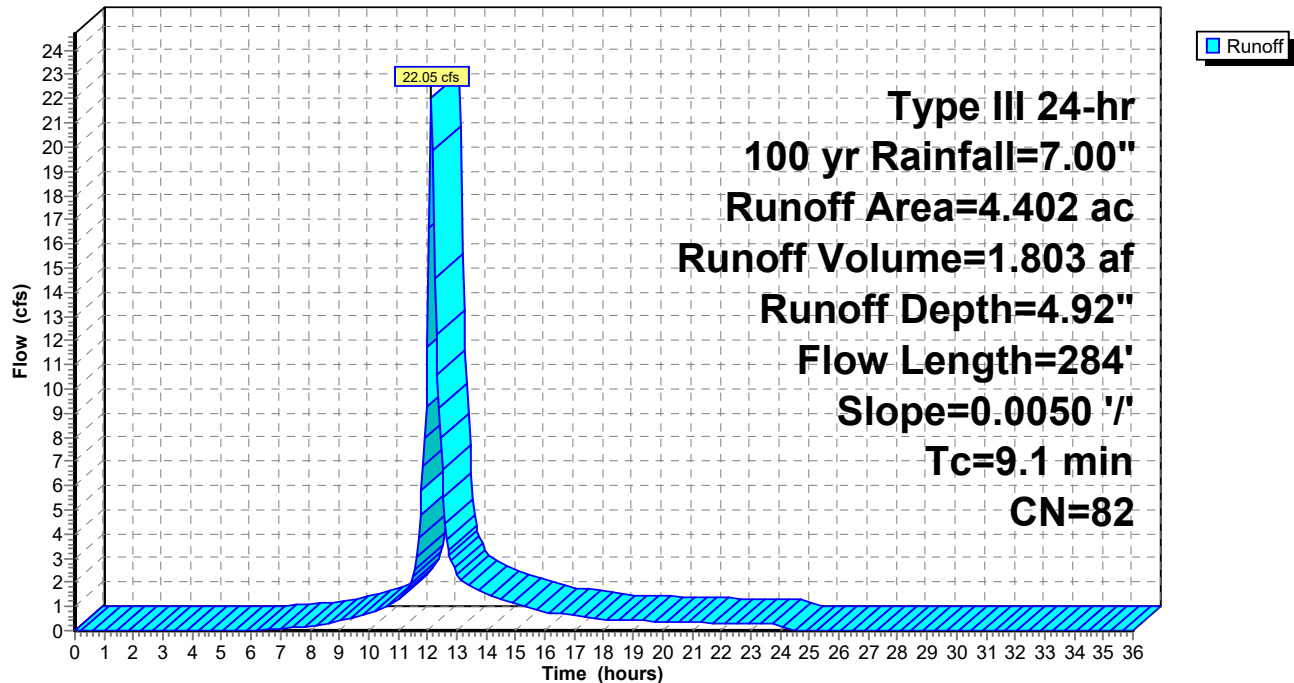
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
1.892	61	>75% Grass cover, Good, HSG B
2.510	98	Paved parking, HSG B
4.402	82	Weighted Average
1.892		42.98% Pervious Area
2.510		57.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	50	0.0050	0.69		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.20"
7.9	234	0.0050	0.49		Shallow Concentrated Flow, B-C
					Short Grass Pasture Kv= 7.0 fps
9.1	284	Total			

Subcatchment PR-1: PR-1

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-1A: PR-1A

Runoff = 3.03 cfs @ 12.09 hrs, Volume= 0.236 af, Depth= 5.94"

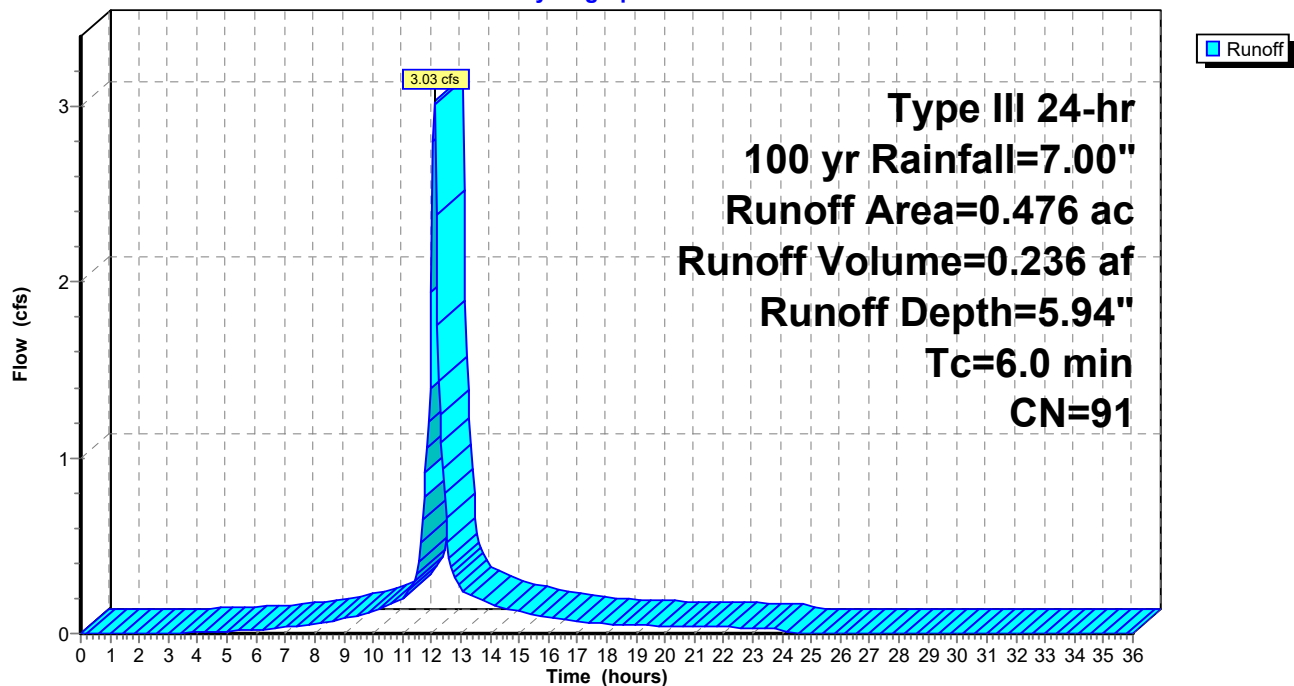
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.090	61	>75% Grass cover, Good, HSG B
0.386	98	Paved parking, HSG B
0.476	91	Weighted Average
0.090		18.91% Pervious Area
0.386		81.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1A: PR-1A

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-1B: PR-1B

Runoff = 12.57 cfs @ 12.09 hrs, Volume= 1.056 af, Depth= 6.76"

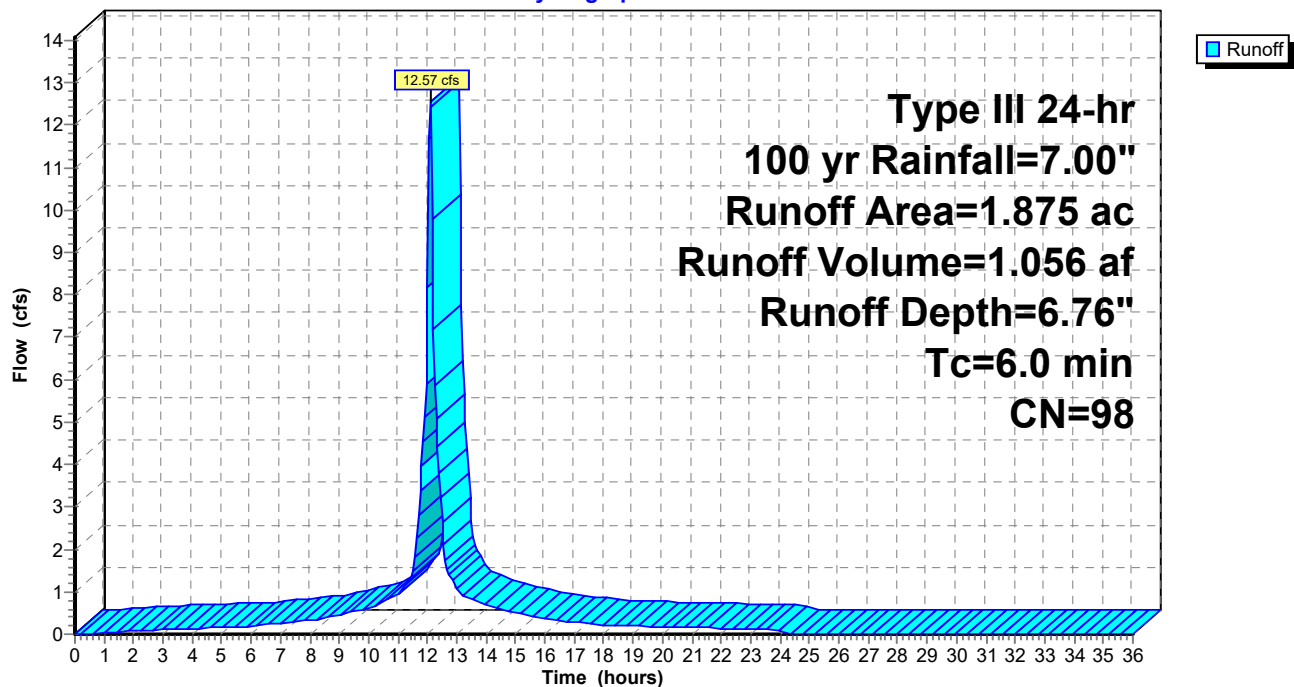
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
1.875	98	Roofs, HSG B
1.875		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1B: PR-1B

Hydrograph



17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-1C: PR-1C

Runoff = 2.19 cfs @ 12.09 hrs, Volume= 0.159 af, Depth= 4.15"

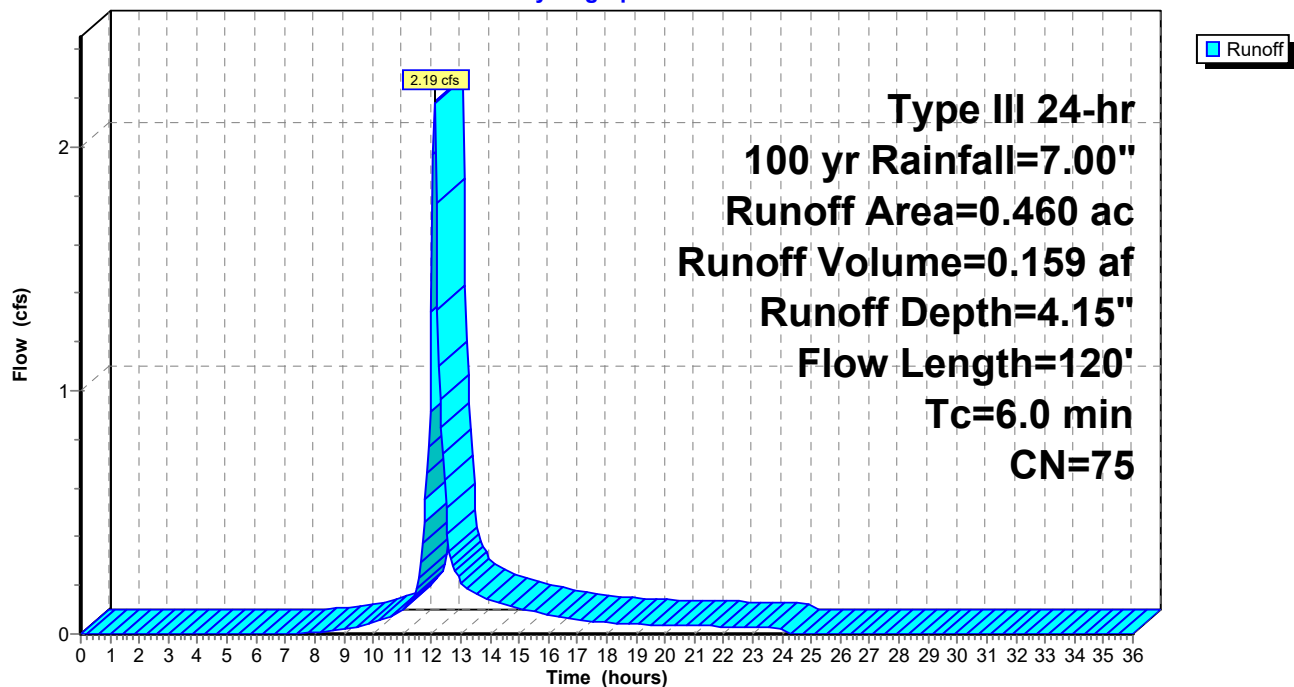
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.020	55	Woods, Good, HSG B
0.260	61	>75% Grass cover, Good, HSG B
0.180	98	Paved parking, HSG B
0.460	75	Weighted Average
0.280		60.87% Pervious Area
0.180		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	20	0.0700	0.09		Sheet Flow, 20' SF
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.9	40	0.5000	0.35		Sheet Flow, 30' SF
					Grass: Dense n= 0.240 P2= 3.20"
0.1	12	0.0100	1.61		Shallow Concentrated Flow, 12' SCF
					Unpaved Kv= 16.1 fps
0.2	48	0.0400	4.06		Shallow Concentrated Flow, 48' SCF
					Paved Kv= 20.3 fps
5.8	120	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-1C: PR-1C

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-1D: PR-1D

Runoff = 10.07 cfs @ 12.09 hrs, Volume= 0.846 af, Depth= 6.76"

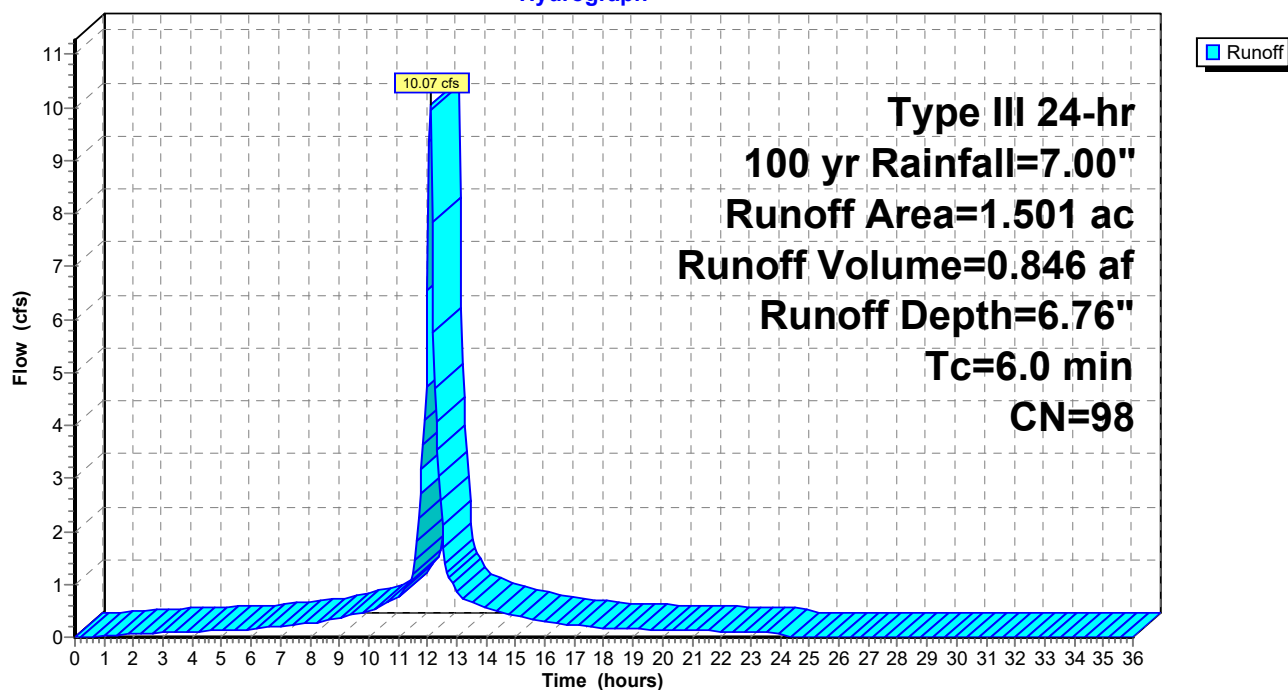
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
1.501	98	Roofs, HSG B
1.501		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-1D: PR-1D

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-1E: PR-1E

Runoff = 5.88 cfs @ 12.17 hrs, Volume= 0.516 af, Depth= 4.04"

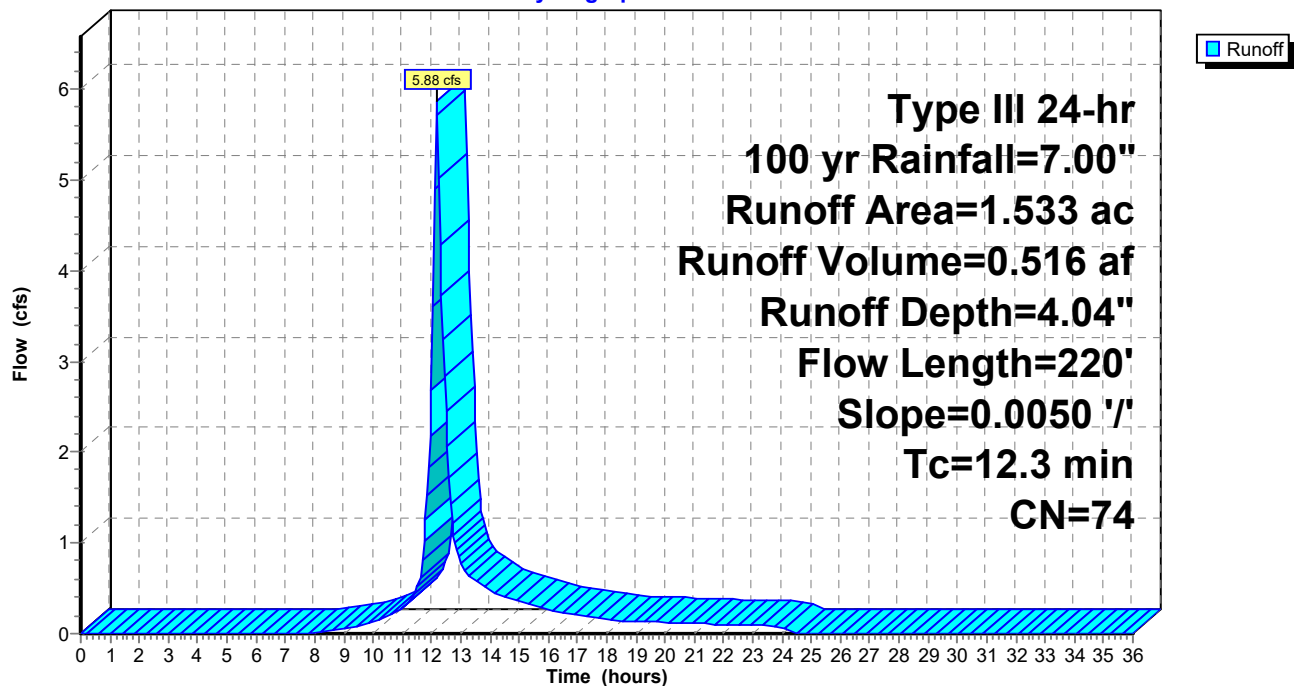
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
1.000	61	>75% Grass cover, Good, HSG B
0.533	98	Paved parking, HSG B
1.533	74	Weighted Average
1.000		65.23% Pervious Area
0.533		34.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	50	0.0050	0.09		Sheet Flow, 50' SF
					Grass: Short n= 0.150 P2= 3.20"
2.5	170	0.0050	1.14		Shallow Concentrated Flow, 170' SCF
					Unpaved Kv= 16.1 fps
12.3	220	Total			

Subcatchment PR-1E: PR-1E

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-2: PR-2

Runoff = 7.81 cfs @ 12.09 hrs, Volume= 0.574 af, Depth= 4.81"

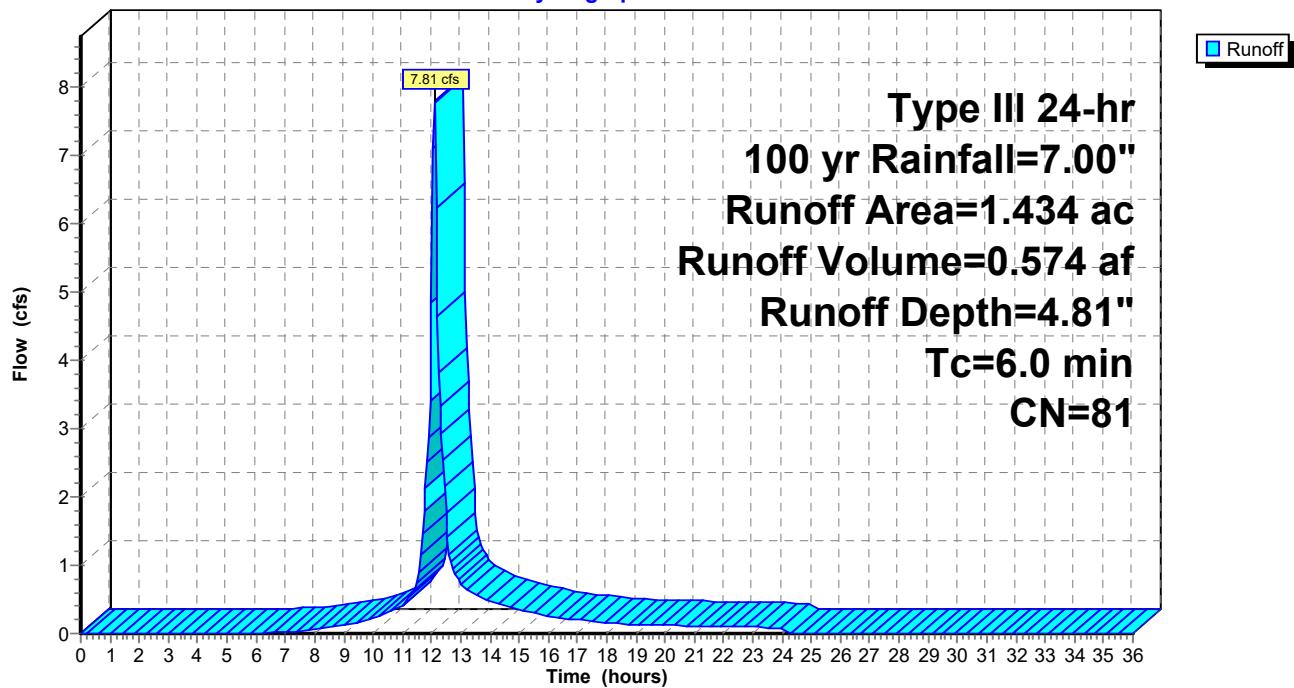
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.672	61	>75% Grass cover, Good, HSG B
0.762	98	Paved parking, HSG B
1.434	81	Weighted Average
0.672		46.86% Pervious Area
0.762		53.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2: PR-2

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-2A: PR-2B

Runoff = 1.68 cfs @ 12.09 hrs, Volume= 0.141 af, Depth= 6.76"

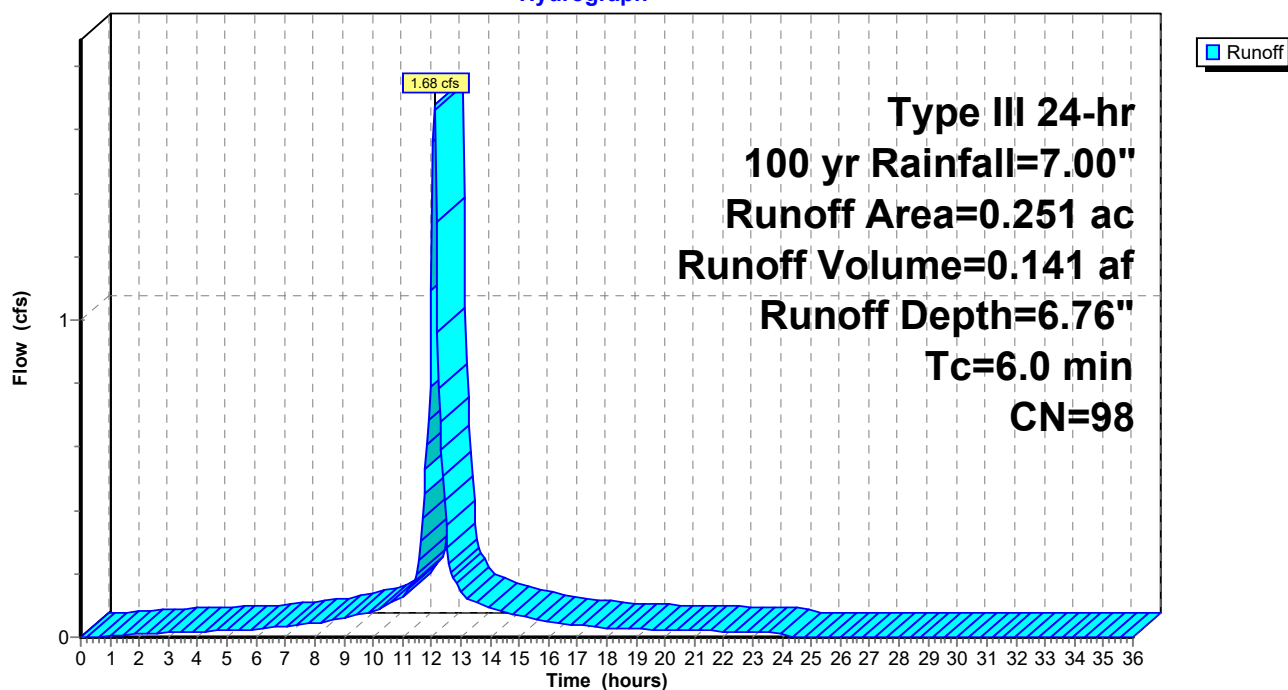
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.251	98	Roofs, HSG B
0.251		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-2A: PR-2B

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-3A: PR-3A

Runoff = 4.24 cfs @ 12.09 hrs, Volume= 0.317 af, Depth= 5.25"

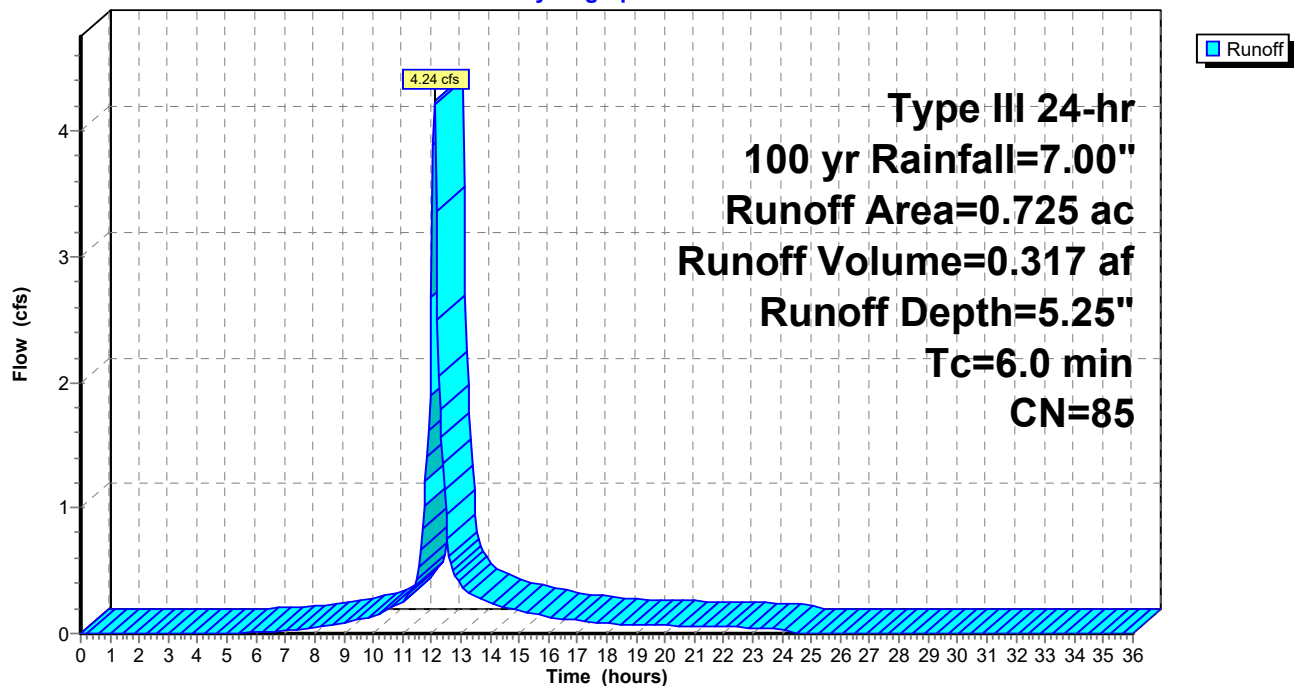
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.249	61	>75% Grass cover, Good, HSG B
0.476	98	Paved parking, HSG B
0.725	85	Weighted Average
0.249		34.34% Pervious Area
0.476		65.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3A: PR-3A

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-3B: PR-3B

Runoff = 1.26 cfs @ 12.09 hrs, Volume= 0.092 af, Depth= 4.58"

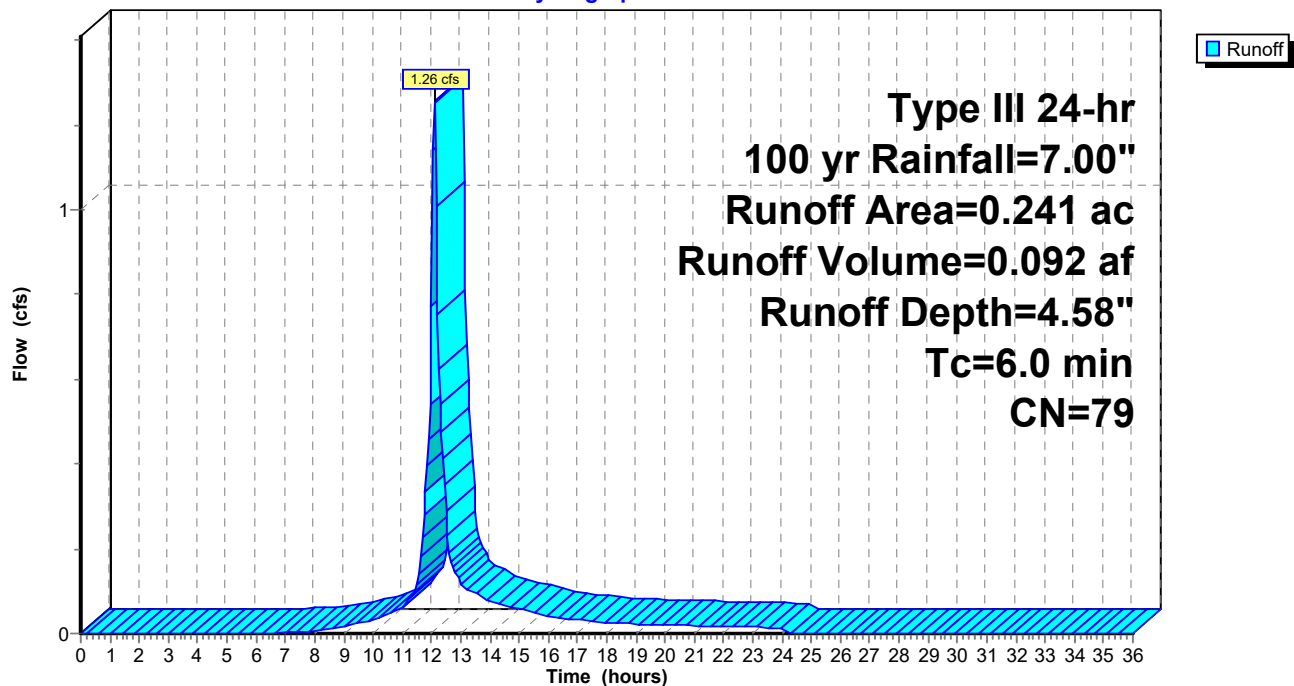
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.124	61	>75% Grass cover, Good, HSG B
0.117	98	Paved parking, HSG B
0.241	79	Weighted Average
0.124		51.45% Pervious Area
0.117		48.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3B: PR-3B

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-3C: PR-3C

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 2.70"

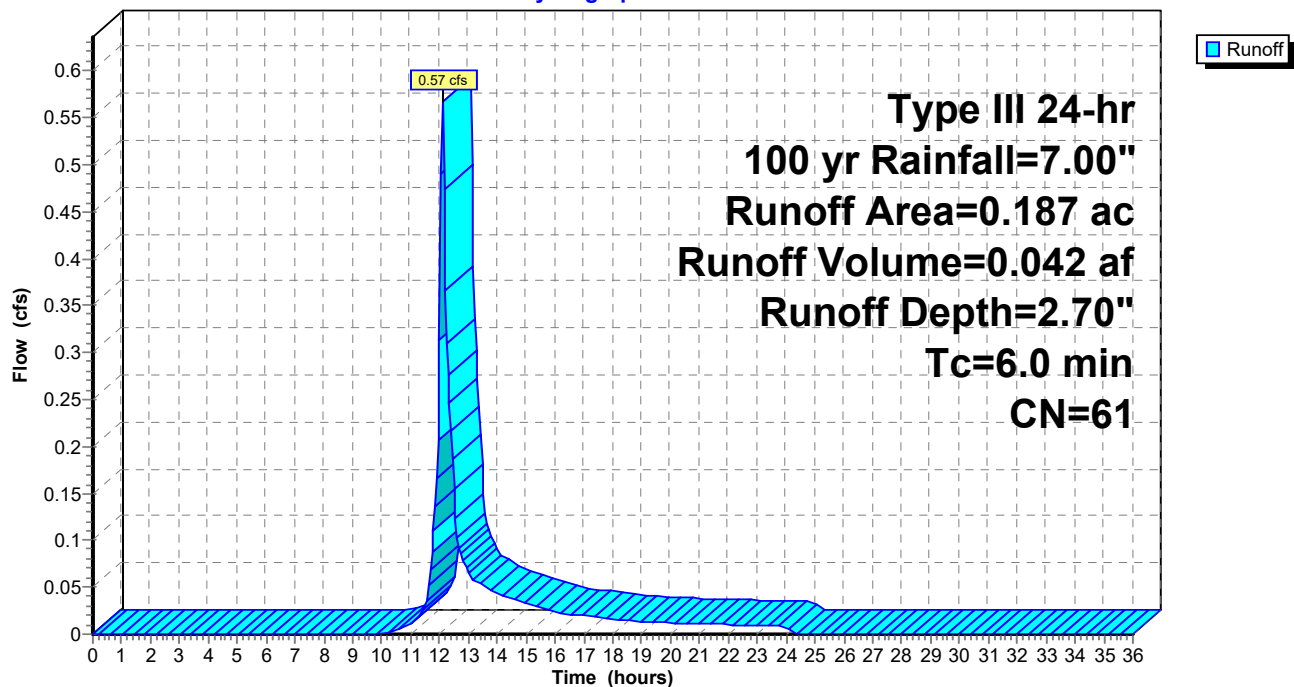
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
0.187	61	>75% Grass cover, Good, HSG B
0.187		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PR-3C: PR-3C

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-4A: PR-5A

Runoff = 2.68 cfs @ 12.57 hrs, Volume= 0.412 af, Depth= 5.25"

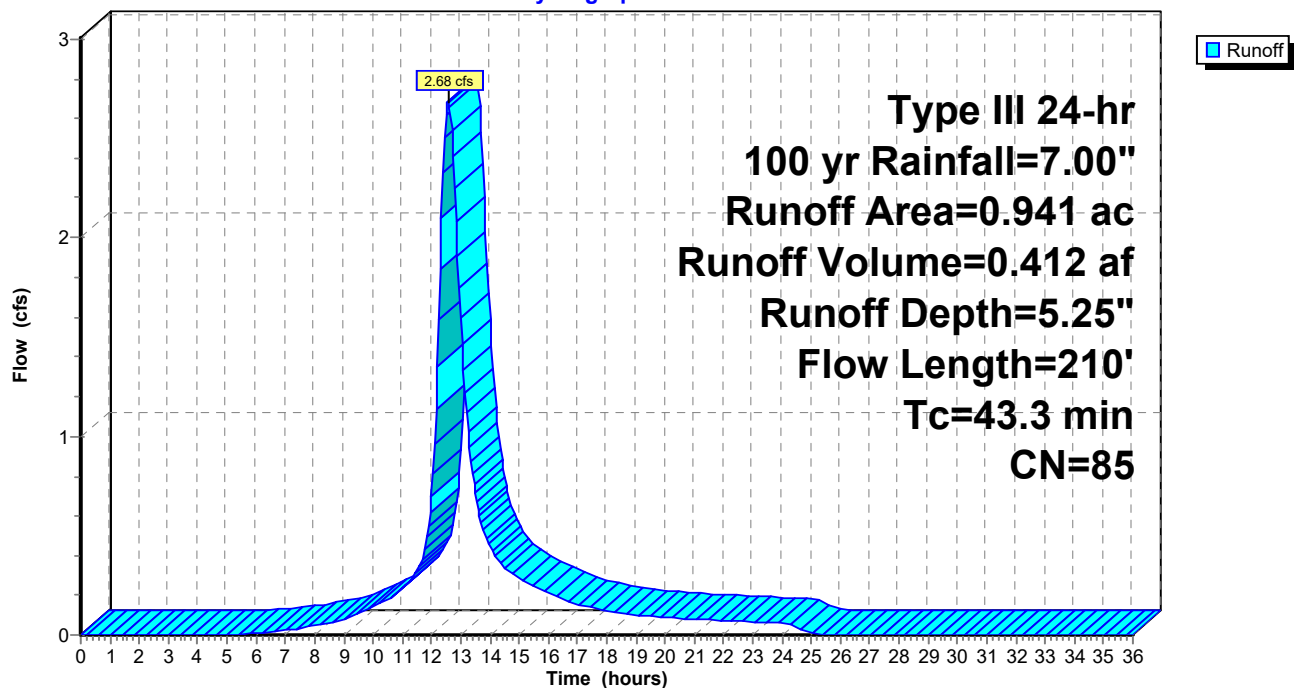
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
* 0.941	85	SYNTHETIC TURF- PAD- LINER
0.941		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	110	0.0055	0.05		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
43.3	210	Total			

Subcatchment PR-4A: PR-5A

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-4B: SB 11 A

Runoff = 2.68 cfs @ 12.50 hrs, Volume= 0.382 af, Depth= 5.25"

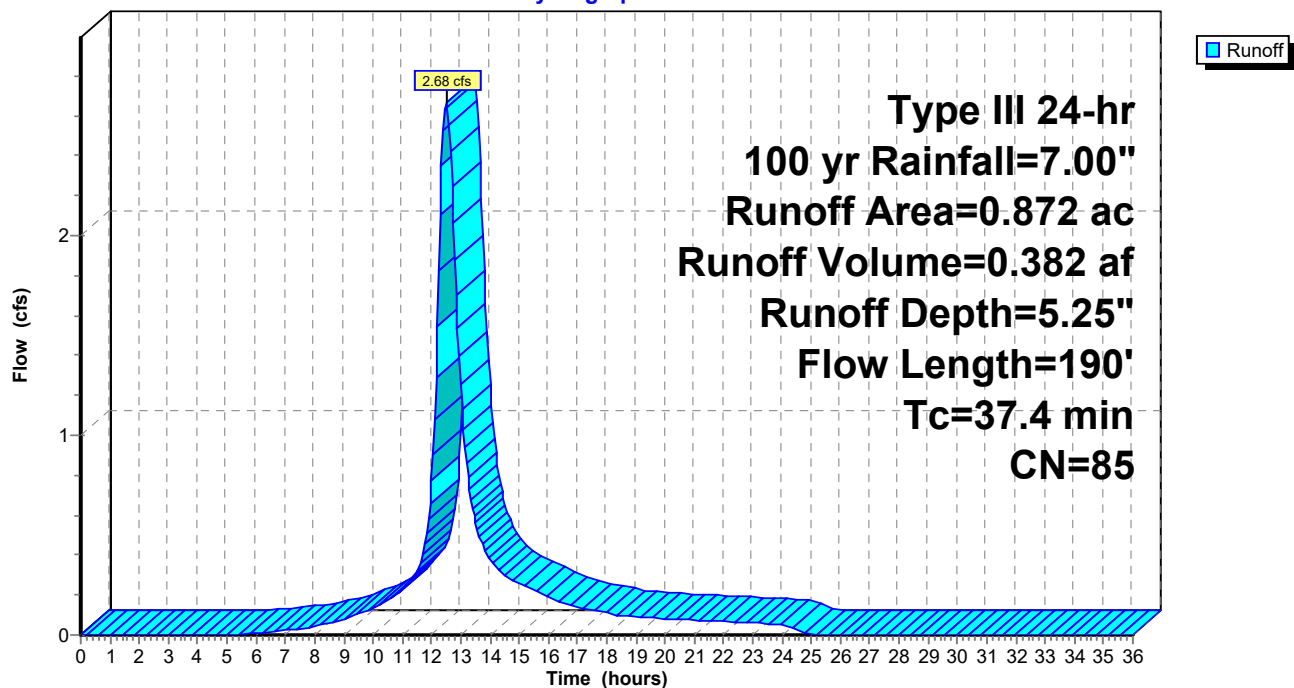
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Description
* 0.872	85	SYNTHETIC TURF- PAD- LINER
0.872		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.7	90	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
3.7	100	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
37.4	190	Total			

Subcatchment PR-4B: SB 11 A

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-4C: SB 00 DPW SLOPE

Runoff = 0.38 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 3.10"

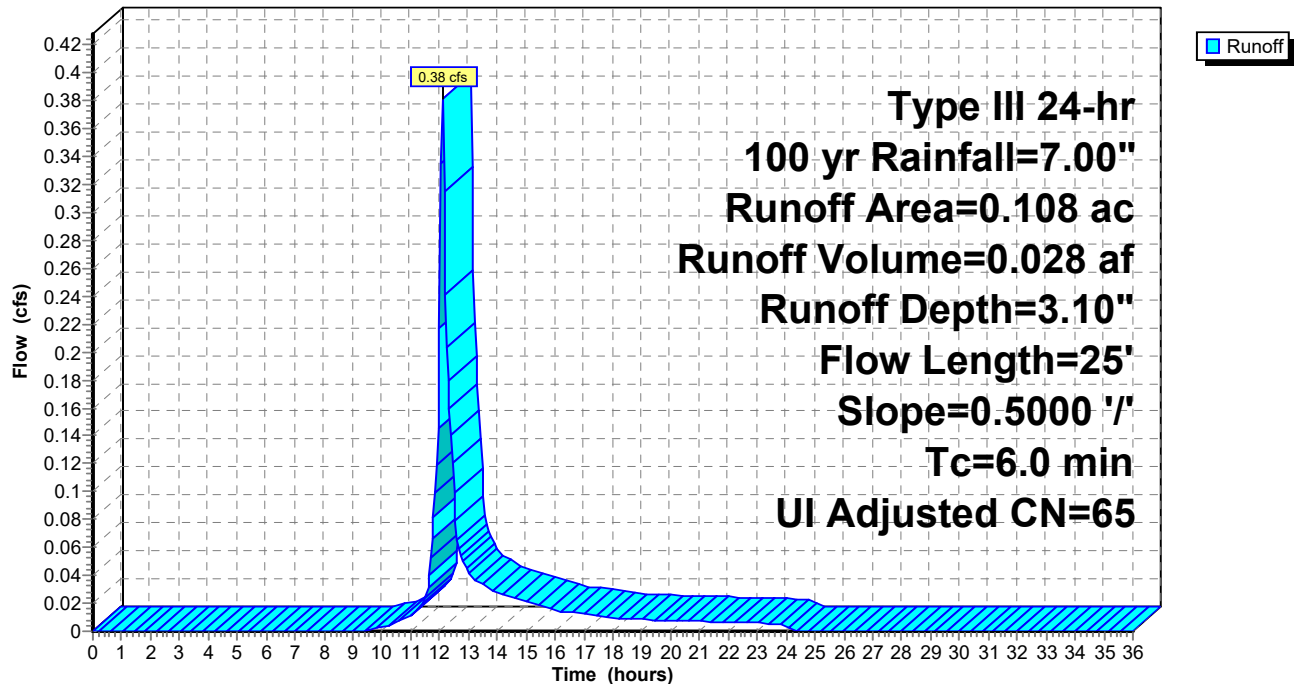
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (ac)	CN	Adj	Description
0.025	98		Unconnected pavement, HSG B
0.083	61		>75% Grass cover, Good, HSG B
0.108	70	65	Weighted Average, UI Adjusted
0.083			76.85% Pervious Area
0.025			23.15% Impervious Area
0.025			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	25	0.5000	0.32		Sheet Flow, SLOPING LAND
					Grass: Dense n= 0.240 P2= 3.20"
1.3	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment PR-4C: SB 00 DPW SLOPE

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-5A: BB 01 A

Runoff = 2.28 cfs @ 12.27 hrs, Volume= 0.246 af, Depth= 5.25"

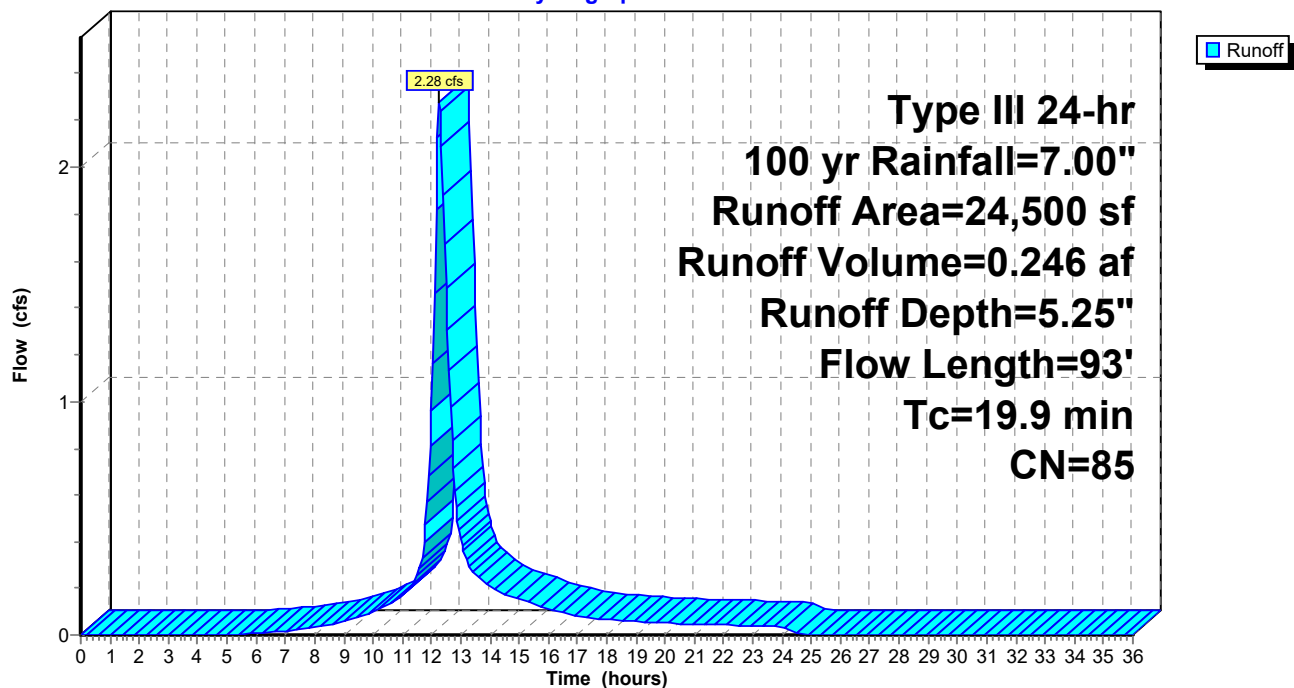
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
*	24,500	85	SYNTHETIC TURF- PAD- LINER
	24,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	46	0.0067	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
19.9	93				Total

Subcatchment PR-5A: BB 01 A

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Subcatchment PR-5B: BB 11 A

Runoff = 3.75 cfs @ 12.87 hrs, Volume= 0.736 af, Depth= 5.25"

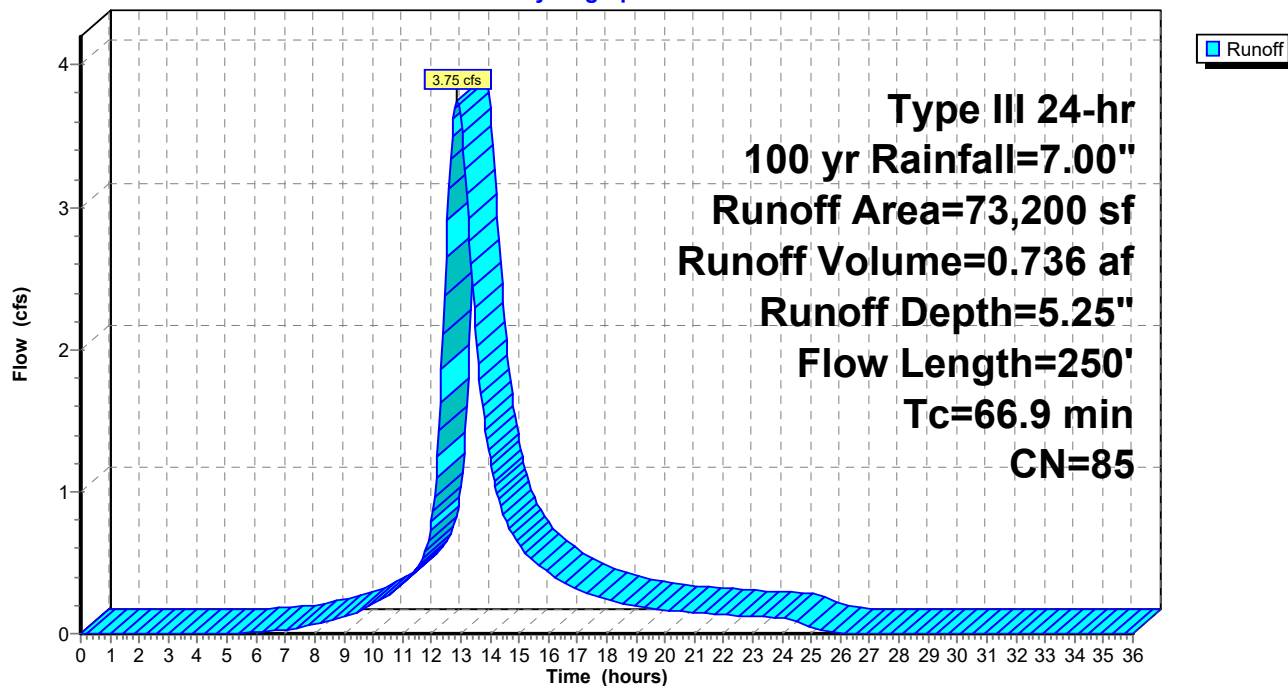
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
*	73,200	85	SYNTHETIC TURF- PAD- LINER
	73,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.1	53	0.0055	0.04		Sheet Flow, Through Turf Section Grass: Bermuda n= 0.410 P2= 3.20"
43.1	150	0.0083	0.06		Sheet Flow, SYNTHETIC TURF Grass: Bermuda n= 0.410 P2= 3.20"
1.7	47	0.0001	0.45	0.16	Pipe Channel, TRENCH DRAIN LEVEL 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.010
66.9	250	Total			

Subcatchment PR-5B: BB 11 A

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.00"

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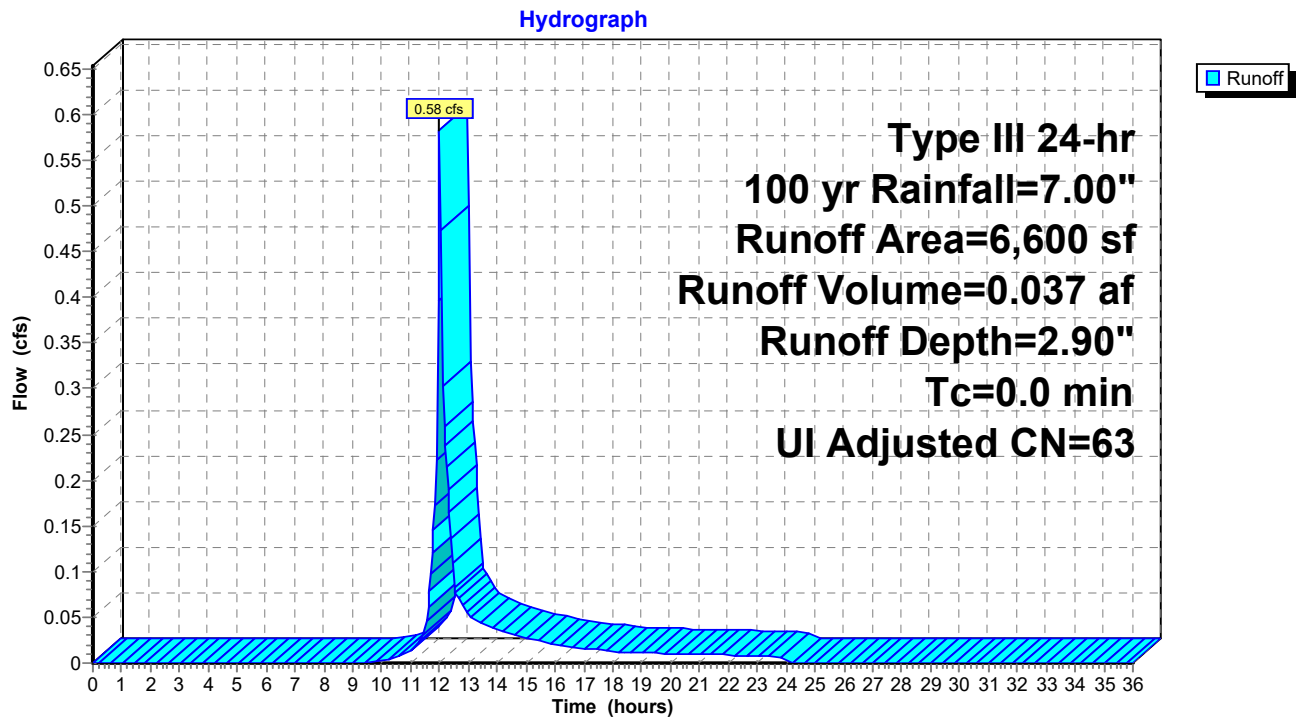
Summary for Subcatchment PR-5C: SLOPE

Runoff = 0.58 cfs @ 12.01 hrs, Volume= 0.037 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (sf)	CN	Adj	Description
600	98		Unconnected roofs, HSG B
6,000	61		>75% Grass cover, Good, HSG B
6,600	64	63	Weighted Average, UI Adjusted
6,000			90.91% Pervious Area
600			9.09% Impervious Area
600			100.00% Unconnected

Subcatchment PR-5C: SLOPE



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Pond 1P: rain garden#1 cascading

Inflow Area = 0.725 ac, 65.66% Impervious, Inflow Depth = 5.25" for 100 yr event
 Inflow = 4.24 cfs @ 12.09 hrs, Volume= 0.317 af
 Outflow = 4.50 cfs @ 12.10 hrs, Volume= 0.315 af, Atten= 0%, Lag= 0.7 min
 Primary = 2.91 cfs @ 12.10 hrs, Volume= 0.304 af
 Secondary = 1.59 cfs @ 12.10 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 62.09' @ 12.10 hrs Surf.Area= 517 sf Storage= 596 cf

Flood Elev= 63.00' Surf.Area= 660 sf Storage= 1,132 cf

Plug-Flow detention time= 31.1 min calculated for 0.315 af (99% of inflow)

Center-of-Mass det. time= 27.2 min (822.2 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,048 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 1,348 cf Overall - 300 cf Embedded = 1,048 cf
#2	58.50'	30 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 75 cf Overall x 40.0% Voids
#3	59.00'	50 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 199 cf Overall x 25.0% Voids
#4	60.33'	5 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 26 cf Overall x 20.0% Voids
		1,132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
60.50	150	300	300
61.00	236	97	397
62.00	503	370	766
63.00	660	582	1,348

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	150	0	0
59.00	150	75	75

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	150	0	0
60.33	150	199	199

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.33	150	0	0
60.50	150	26	26

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Type III 24-hr 100 yr Rainfall=7.00"

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Device	Routing	Invert	Outlet Devices
#1	Device 3	58.50'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	62.00'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	58.50'	8.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 58.50' / 58.40' S= 0.0050 ' / Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Device 3	61.50'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.91 cfs @ 12.10 hrs HW=62.09' TW=54.59' (Dynamic Tailwater)

← **3=Culvert** (Passes 2.91 cfs of 3.03 cfs potential flow)

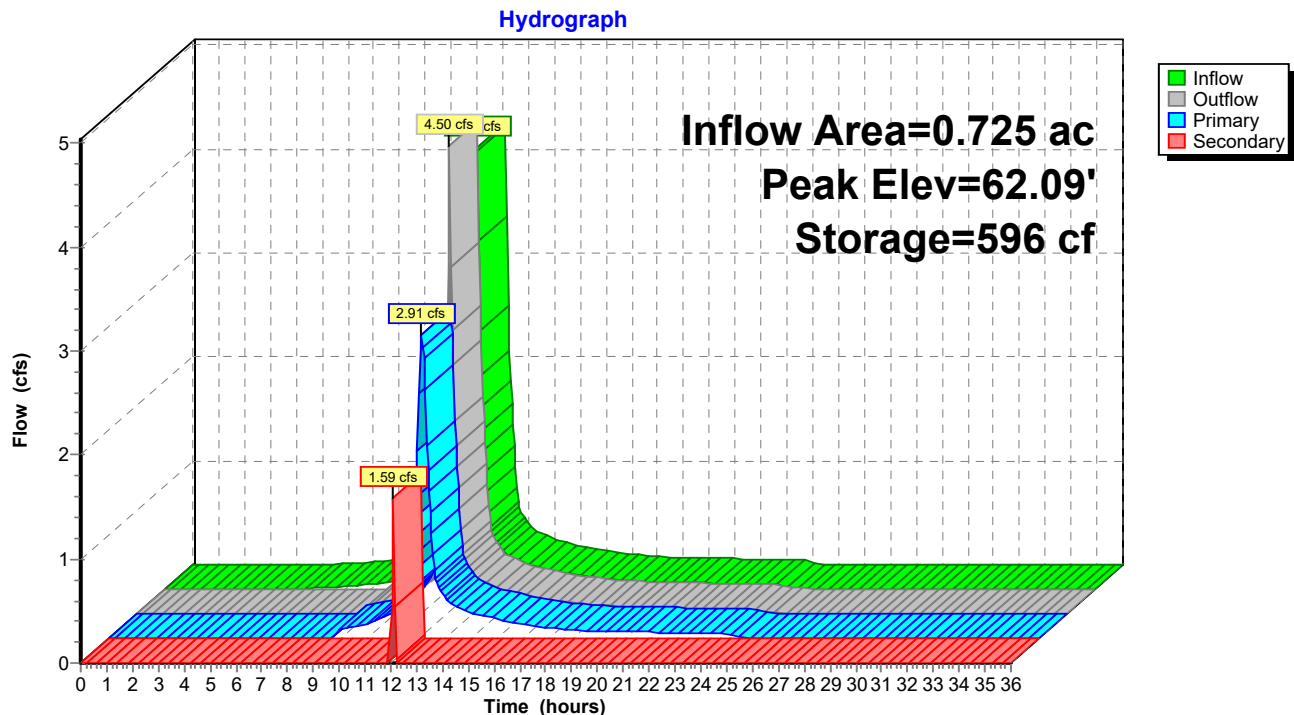
← **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

← **4=Orifice/Grate** (Orifice Controls 2.90 cfs @ 3.69 fps)

Secondary OutFlow Max=1.59 cfs @ 12.10 hrs HW=62.09' TW=54.59' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Weir Controls 1.59 cfs @ 0.72 fps)

Pond 1P: rain garden#1 cascading



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Pond 2P: rain garden#2 cascading

Inflow Area = 0.966 ac, 61.39% Impervious, Inflow Depth > 5.06" for 100 yr event
 Inflow = 5.76 cfs @ 12.10 hrs, Volume= 0.407 af
 Outflow = 5.30 cfs @ 12.12 hrs, Volume= 0.400 af, Atten= 8%, Lag= 1.5 min
 Primary = 3.54 cfs @ 12.12 hrs, Volume= 0.387 af
 Secondary = 1.77 cfs @ 12.12 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 54.61' @ 12.12 hrs Surf.Area= 1,080 sf Storage= 1,315 cf

Flood Elev= 55.00' Surf.Area= 1,326 sf Storage= 1,784 cf

Plug-Flow detention time= 44.3 min calculated for 0.400 af (98% of inflow)

Center-of-Mass det. time= 28.7 min (848.2 - 819.6)

Volume	Invert	Avail.Storage	Storage Description
#1	51.00'	1,557 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 2,357 cf Overall - 800 cf Embedded = 1,557 cf
#2	51.00'	80 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 200 cf Overall x 40.0% Voids
#3	51.50'	133 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 532 cf Overall x 25.0% Voids
#4	52.83'	14 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 68 cf Overall x 20.0% Voids
		1,784 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
53.00	400	800	800
54.00	694	547	1,347
55.00	1,326	1,010	2,357

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.00	400	0	0
51.50	400	200	200

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
51.50	400	0	0
52.83	400	532	532

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.83	400	0	0
53.00	400	68	68

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Device	Routing	Invert	Outlet Devices
#1	Device 3	51.00'	1.020 in/hr Exfiltration over Surface area
#2	Secondary	54.50'	25.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Primary	51.00'	12.0" Round Culvert L= 25.0' Ke= 0.500 Inlet / Outlet Invert= 51.00' / 50.88' S= 0.0048 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Device 3	53.75'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.49 cfs @ 12.12 hrs HW=54.59' TW=49.02' (Dynamic Tailwater)

← **3=Culvert** (Passes 3.49 cfs of 6.64 cfs potential flow)

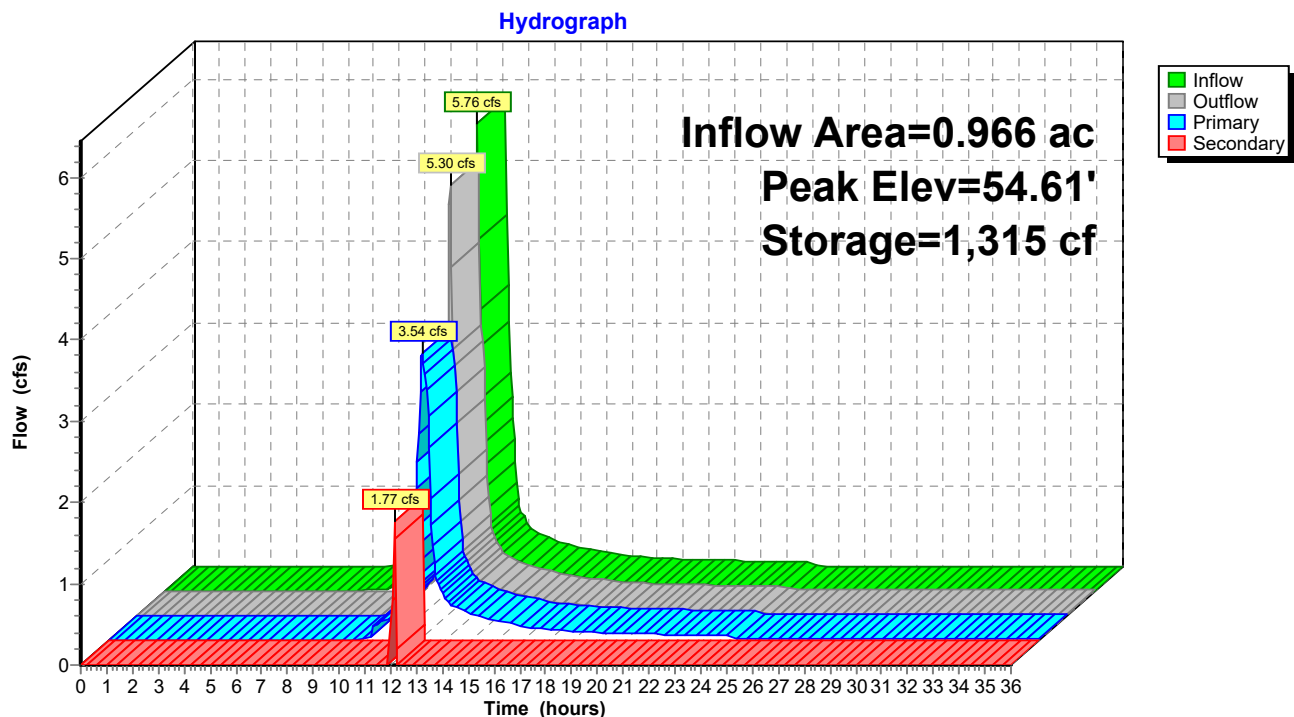
← **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

← **4=Orifice/Grate** (Orifice Controls 3.46 cfs @ 4.41 fps)

Secondary OutFlow Max=1.57 cfs @ 12.12 hrs HW=54.59' TW=49.02' (Dynamic Tailwater)

← **2=Broad-Crested Rectangular Weir** (Weir Controls 1.57 cfs @ 0.72 fps)

Pond 2P: rain garden#2 cascading



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Summary for Pond 3P: rain garden#3 cascading

Inflow Area = 1.153 ac, 51.43% Impervious, Inflow Depth > 4.60" for 100 yr event
 Inflow = 5.85 cfs @ 12.12 hrs, Volume= 0.442 af
 Outflow = 5.83 cfs @ 12.14 hrs, Volume= 0.428 af, Atten= 0%, Lag= 1.0 min
 Primary = 5.83 cfs @ 12.14 hrs, Volume= 0.428 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 49.03' @ 12.14 hrs Surf.Area= 969 sf Storage= 1,147 cf

Flood Elev= 50.00' Surf.Area= 1,373 sf Storage= 2,283 cf

Plug-Flow detention time= 55.2 min calculated for 0.428 af (97% of inflow)

Center-of-Mass det. time= 25.0 min (873.5 - 848.5)

Volume	Invert	Avail.Storage	Storage Description
#1	46.00'	1,944 cf	Rain Garden Envelope (Prismatic) Listed below (Recalc) 3,144 cf Overall - 1,200 cf Embedded = 1,944 cf
#2	46.00'	120 cf	crush stone (Prismatic) Listed below (Recalc) Inside #1 300 cf Overall x 40.0% Voids
#3	46.50'	199 cf	Bio Media (Prismatic) Listed below (Recalc) Inside #1 798 cf Overall x 25.0% Voids
#4	47.83'	20 cf	Mulch (Prismatic) Listed below (Recalc) Inside #1 102 cf Overall x 20.0% Voids
		2,283 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
48.00	600	1,200	1,200
49.00	957	779	1,979
50.00	1,373	1,165	3,144

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.00	600	0	0
46.50	600	300	300

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.50	600	0	0
47.83	600	798	798

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.83	600	0	0
48.00	600	102	102

Device	Routing	Invert	Outlet Devices
#1	Device 3	46.00'	1.020 in/hr Exfiltration over Surface area
#2	Device 3	48.75'	24.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

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#3 Primary

46.00' 15.0" Round Culvert

L= 26.0' CPP, projecting, no headwall, $K_e = 0.900$

Inlet / Outlet Invert= 46.00' / 45.87' $S = 0.0050$ ' $C_c = 0.900$

$n = 0.013$ Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.64 cfs @ 12.14 hrs HW=49.02' TW=0.00' (Dynamic Tailwater)

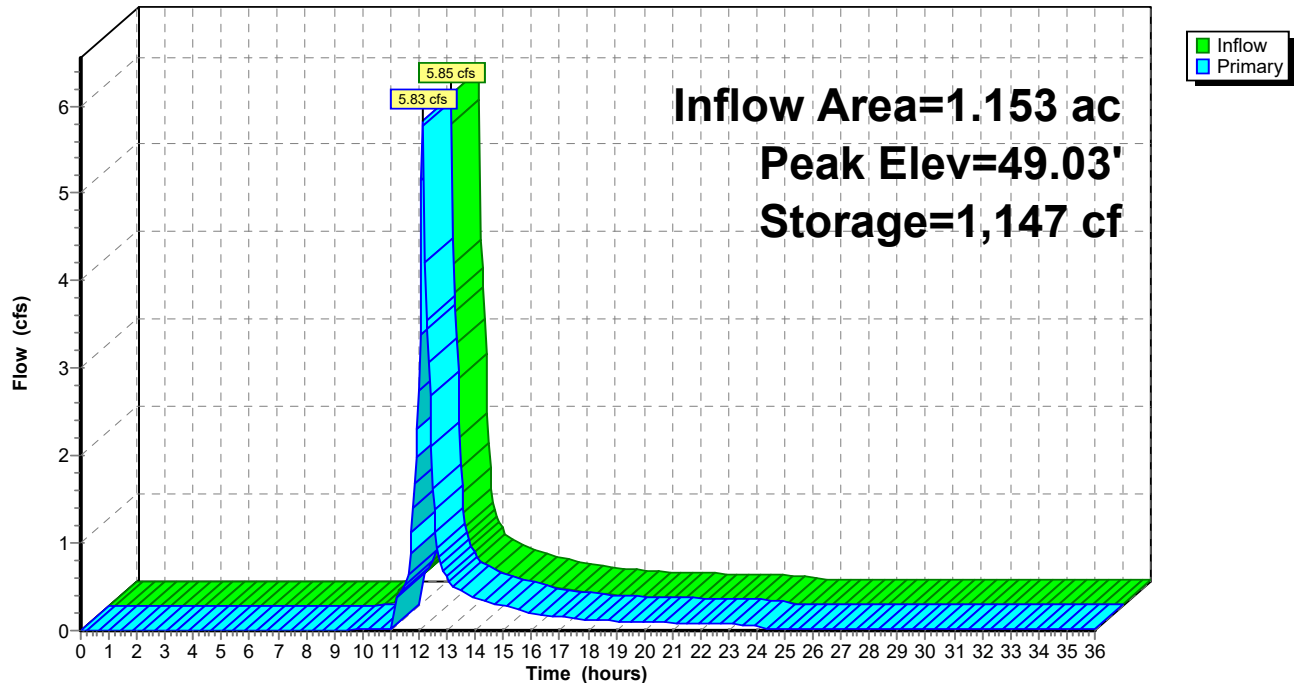
3=Culvert (Passes 5.64 cfs of 7.22 cfs potential flow)

1=Exfiltration (Exfiltration Controls 0.02 cfs)

2=Orifice/Grate (Weir Controls 5.62 cfs @ 1.71 fps)

Pond 3P: rain garden#3 cascading

Hydrograph



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Summary for Pond 4P: UGS-1

Inflow Area = 1.685 ac, 60.12% Impervious, Inflow Depth = 5.10" for 100 yr event
 Inflow = 9.49 cfs @ 12.09 hrs, Volume= 0.716 af
 Outflow = 8.73 cfs @ 12.14 hrs, Volume= 0.695 af, Atten= 8%, Lag= 2.9 min
 Discarded = 0.04 cfs @ 7.20 hrs, Volume= 0.104 af
 Primary = 8.69 cfs @ 12.14 hrs, Volume= 0.590 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 43.90' @ 12.14 hrs Surf.Area= 1,672 sf Storage= 4,651 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 79.1 min (872.2 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	39.50'	2,099 cf	29.92'W x 55.89'L x 5.50'H Field A 9,196 cf Overall - 3,198 cf Embedded = 5,998 cf x 35.0% Voids
#2A	40.25'	3,198 cf	ADS_StormTech MC-3500 d +Capx 28 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 28 Chambers in 4 Rows Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf
		5,297 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	39.50'	24.0" Round Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 39.50' / 39.00' S= 0.0100 ' / Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	43.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Discarded	39.50'	1.020 in/hr Exfiltration over Surface area
#4	Device 1	41.83'	8.0" Vert. Orifice/Grate X 3.00 C= 0.600

Discarded OutFlow Max=0.04 cfs @ 7.20 hrs HW=39.56' (Free Discharge)↑ **3=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=8.39 cfs @ 12.14 hrs HW=43.87' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 8.39 cfs of 27.77 cfs potential flow)↑ **2=Sharp-Crested Rectangular Weir** (Weir Controls 1.80 cfs @ 1.70 fps)↑ **4=Orifice/Grate** (Orifice Controls 6.59 cfs @ 6.29 fps)

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Pond 4P: UGS-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech®MC-3500 d rev 03/14 with Cap volume)

Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf

Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap

Cap Storage= +14.9 cf x 2 x 4 rows = 119.2 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

7 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 53.89' Row Length +12.0" End Stone x 2 = 55.89' Base Length

4 Rows x 77.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 29.92' Base Width

9.0" Base + 45.0" Chamber Height + 12.0" Cover = 5.50' Field Height

28 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 4 Rows = 3,197.9 cf Chamber Storage

9,196.2 cf Field - 3,197.9 cf Chambers = 5,998.4 cf Stone x 35.0% Voids = 2,099.4 cf Stone Storage

Chamber Storage + Stone Storage = 5,297.3 cf = 0.122 af

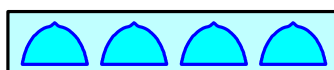
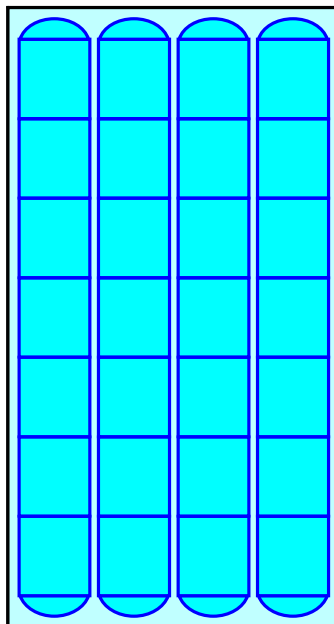
Overall Storage Efficiency = 57.6%

Overall System Size = 55.89' x 29.92' x 5.50'

28 Chambers

340.6 cy Field

222.2 cy Stone



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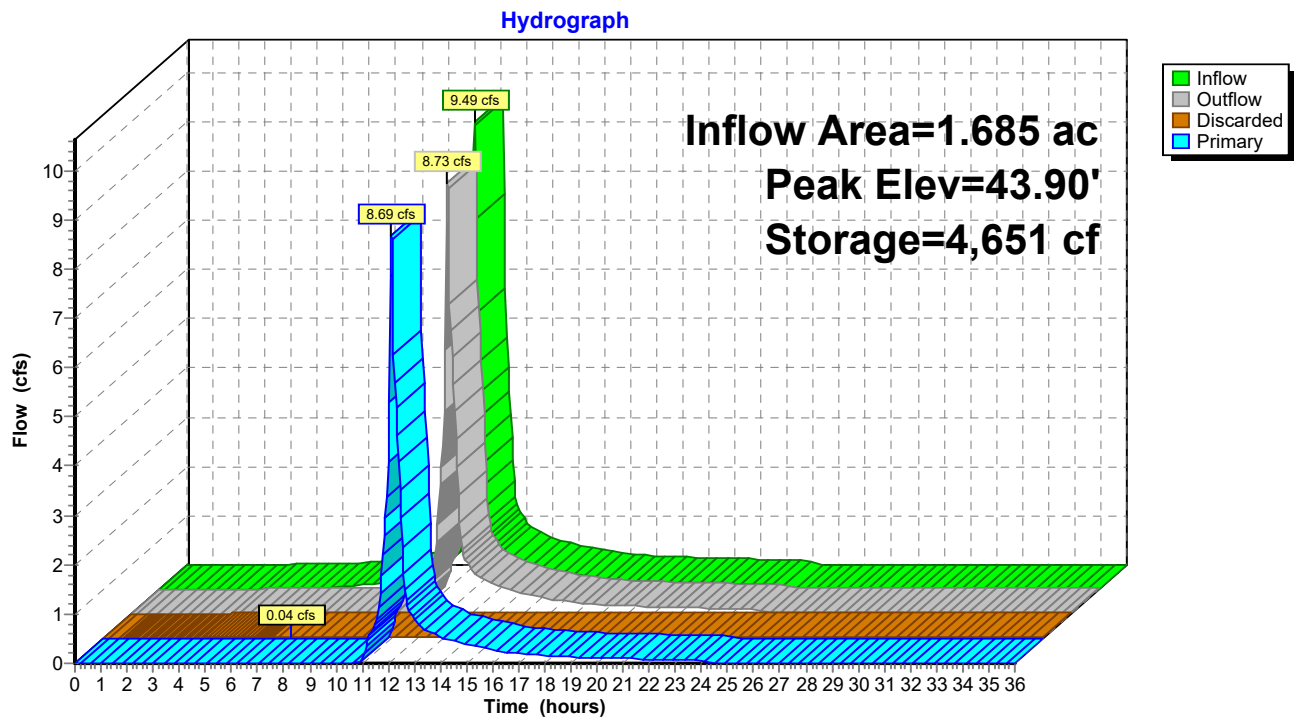
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Pond 4P: UGS-1



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Summary for Pond BB 01 B: BB 01 B

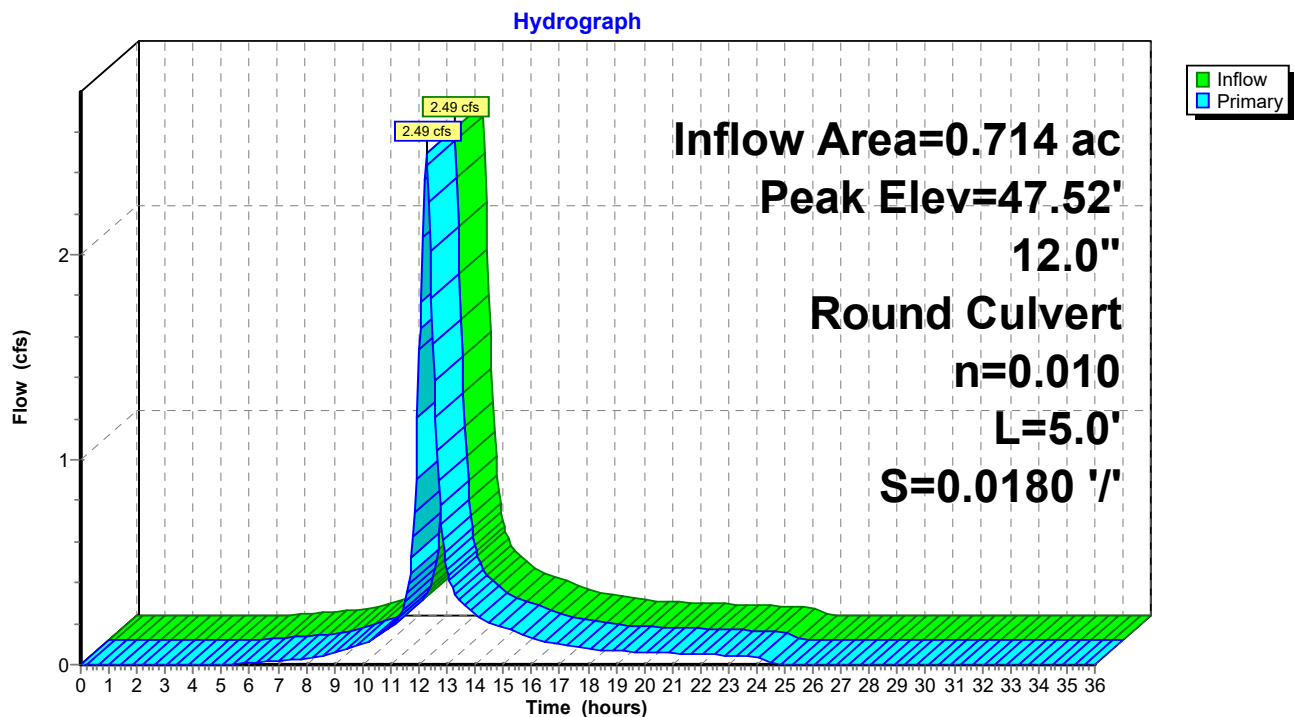
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 4.75" for 100 yr event
Inflow = 2.49 cfs @ 12.26 hrs, Volume= 0.283 af
Outflow = 2.49 cfs @ 12.26 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min
Primary = 2.49 cfs @ 12.26 hrs, Volume= 0.283 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.52' @ 12.55 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.90'	12.0" Round Culvert L= 5.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.90' / 45.81' S= 0.0180 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.92 cfs @ 12.26 hrs HW=47.13' TW=46.88' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.92 cfs @ 2.45 fps)

Pond BB 01 B: BB 01 B



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Summary for Pond BB 01 S: BB 01 S

Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 4.75" for 100 yr event
 Inflow = 2.49 cfs @ 12.26 hrs, Volume= 0.283 af
 Outflow = 1.38 cfs @ 12.55 hrs, Volume= 0.283 af, Atten= 45%, Lag= 17.4 min
 Primary = 1.38 cfs @ 12.55 hrs, Volume= 0.283 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 47.40' @ 12.55 hrs Surf.Area= 0 sf Storage= 2,846 cf

Plug-Flow detention time= 25.8 min calculated for 0.283 af (100% of inflow)
 Center-of-Mass det. time= 25.4 min (837.6 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	44.97'	3,256 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.97	0	0
45.30	16	16
45.80	236	252
46.30	825	1,077
46.80	876	1,953
47.30	792	2,745
47.80	511	3,256

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	4.0" Round Culvert L= 8.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 44.87' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	46.40'	6.0" Round Culvert L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.40' / 46.30' S= 0.0200 ' S= 0.0200 ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf

Primary OutFlow Max=1.38 cfs @ 12.55 hrs HW=47.40' TW=45.59' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.56 cfs @ 6.47 fps)

2=Culvert (Inlet Controls 0.82 cfs @ 4.17 fps)

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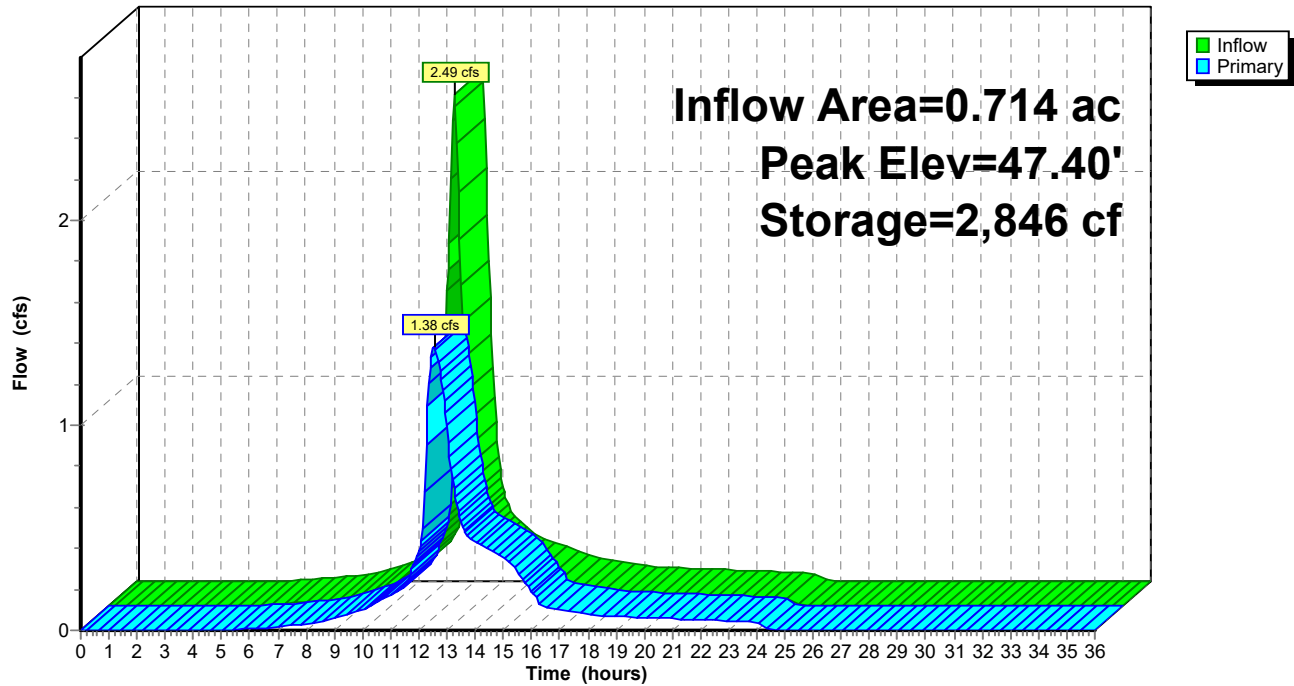
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Pond BB 01 S: BB 01 S

Hydrograph



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Summary for Pond BB 06 B: BB 06 B

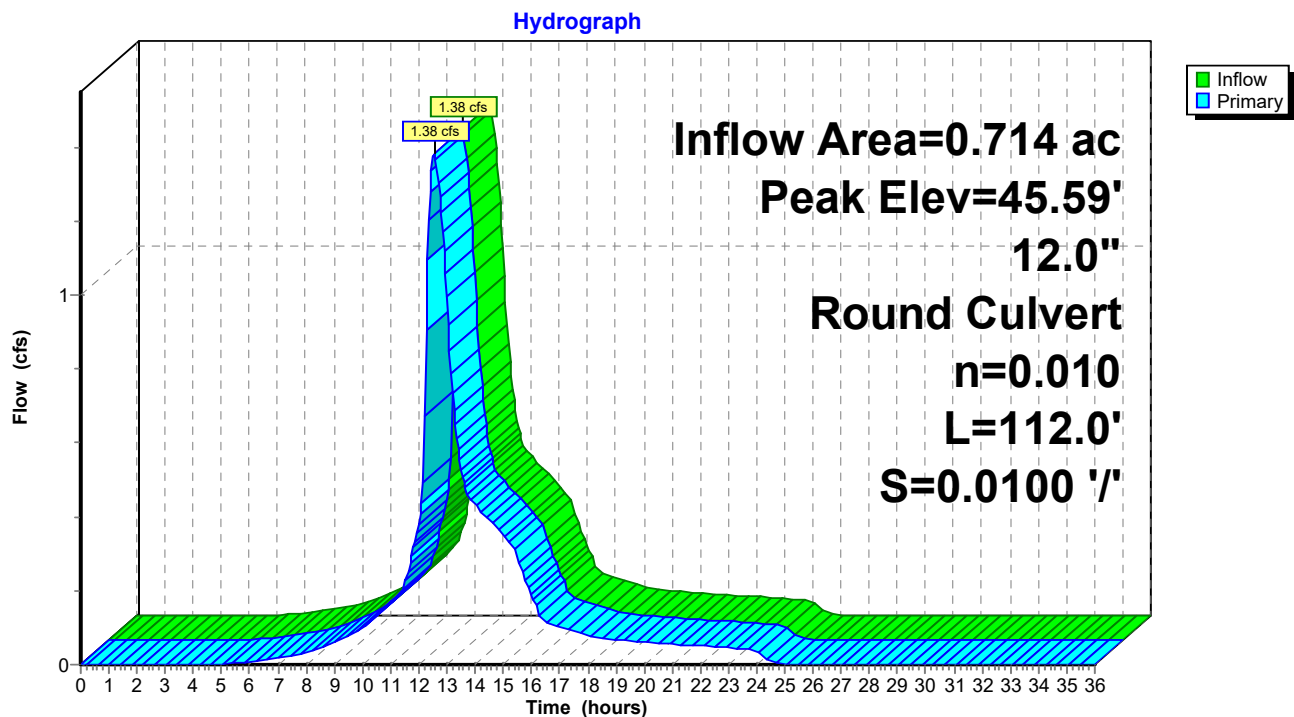
Inflow Area = 0.714 ac, 1.93% Impervious, Inflow Depth = 4.75" for 100 yr event
Inflow = 1.38 cfs @ 12.55 hrs, Volume= 0.283 af
Outflow = 1.38 cfs @ 12.55 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min
Primary = 1.38 cfs @ 12.55 hrs, Volume= 0.283 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 45.59' @ 12.55 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.97'	12.0" Round Culvert L= 112.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.97' / 43.85' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.38 cfs @ 12.55 hrs HW=45.59' TW=43.33' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 1.38 cfs @ 2.69 fps)

Pond BB 06 B: BB 06 B



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Summary for Pond BB 11 B: BB 11 B

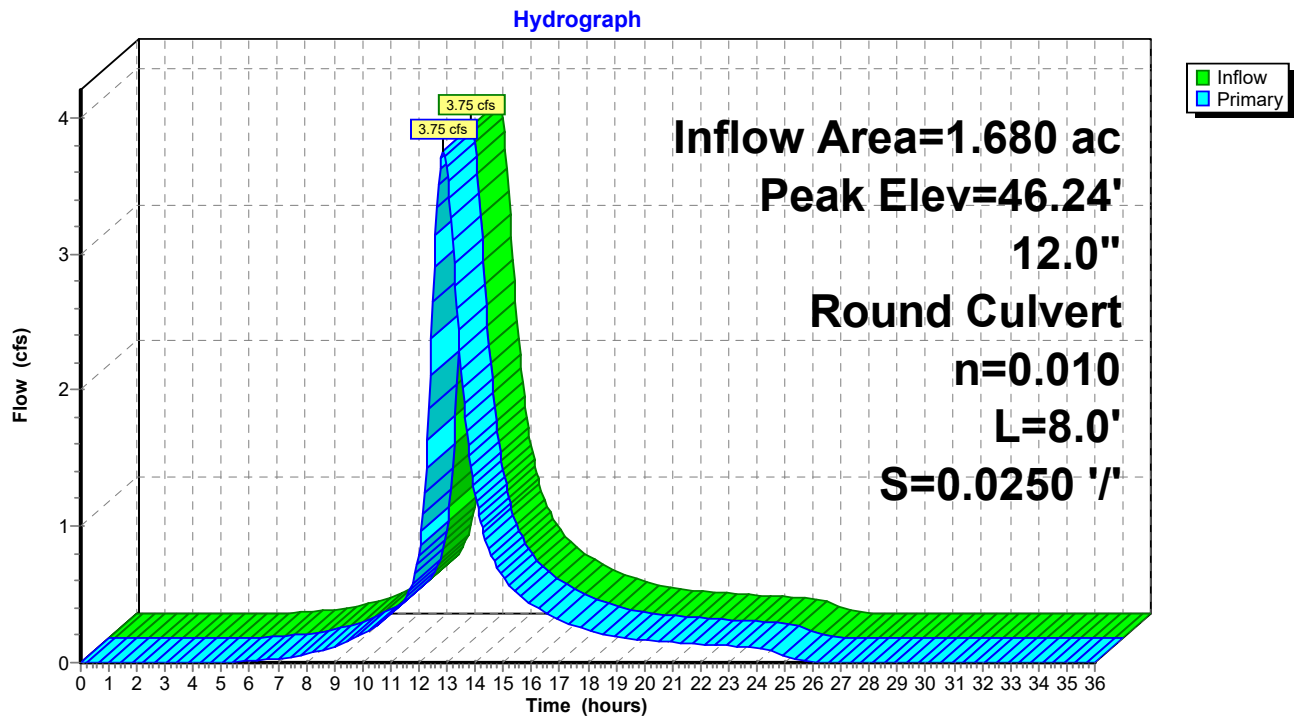
Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 5.25" for 100 yr event
Inflow = 3.75 cfs @ 12.87 hrs, Volume= 0.736 af
Outflow = 3.75 cfs @ 12.87 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min
Primary = 3.75 cfs @ 12.87 hrs, Volume= 0.736 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 46.24' @ 13.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.00'	12.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.00' / 43.80' S= 0.0250 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=3.54 cfs @ 12.87 hrs HW=46.01' TW=45.13' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 3.54 cfs @ 4.50 fps)

Pond BB 11 B: BB 11 B



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Summary for Pond BB 11 S: BB 11 S

Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 5.25" for 100 yr event
 Inflow = 3.75 cfs @ 12.87 hrs, Volume= 0.736 af
 Outflow = 3.24 cfs @ 13.16 hrs, Volume= 0.736 af, Atten= 14%, Lag= 17.6 min
 Primary = 3.24 cfs @ 13.16 hrs, Volume= 0.736 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 45.49' @ 13.16 hrs Surf.Area= 0 sf Storage= 3,794 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 11.3 min (862.8 - 851.5)

Volume	Invert	Avail.Storage	Storage Description
#1	42.97'	4,778 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.97	0	0
43.30	16	16
43.80	481	497
44.30	963	1,460
44.80	1,019	2,479
45.30	1,085	3,564
45.80	603	4,167
46.30	611	4,778

Device	Routing	Invert	Outlet Devices
#1	Primary	42.97'	4.0" Round Culvert L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.97' / 42.81' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	39.70'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.70' / 39.60' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#3	Primary	44.50'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.50' / 44.40' S= 0.0125 ' S= 0.0125 ' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=3.24 cfs @ 13.16 hrs HW=45.49' TW=43.59' (Dynamic Tailwater)

1=Culvert (Outlet Controls 0.58 cfs @ 6.63 fps)
 2=Culvert (Inlet Controls 1.30 cfs @ 6.64 fps)
 3=Culvert (Inlet Controls 1.36 cfs @ 3.90 fps)

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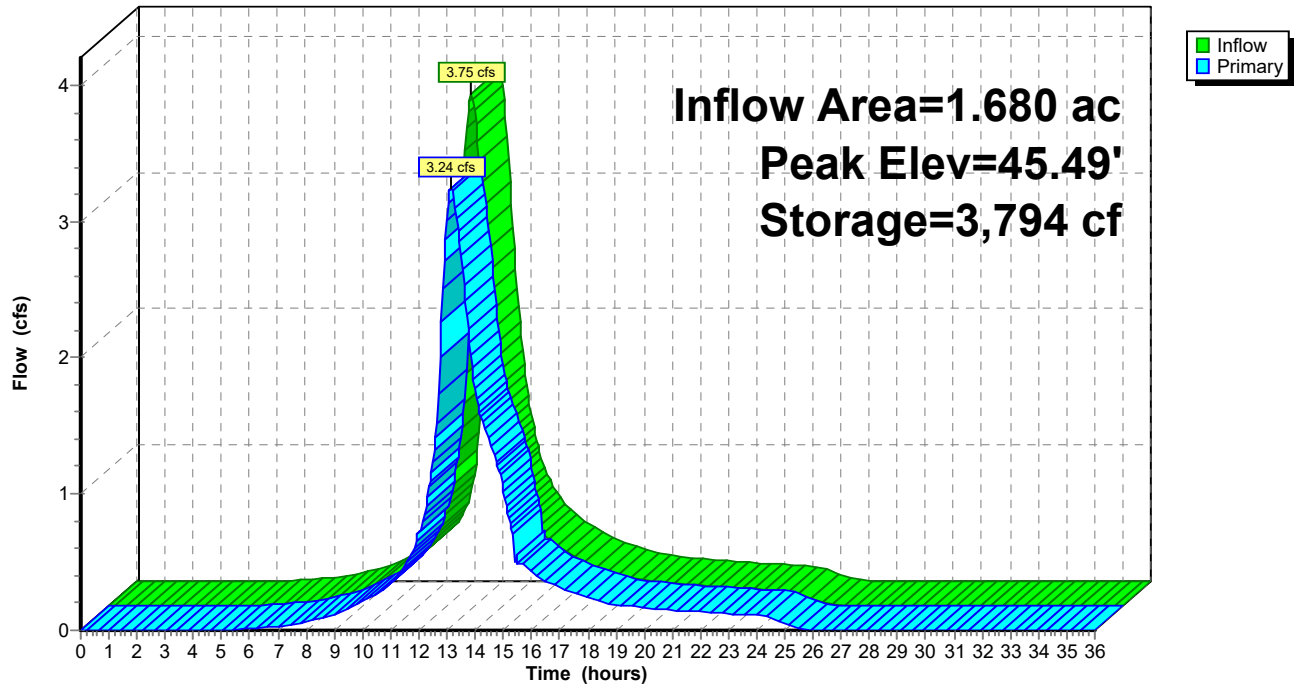
Type III 24-hr 100 yr Rainfall=7.00"

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Pond BB 11 S: BB 11 S

Hydrograph



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Summary for Pond PR-4: PR-4

Inflow Area = 1.921 ac, 1.30% Impervious, Inflow Depth = 5.13" for 100 yr event
Inflow = 3.94 cfs @ 12.83 hrs, Volume= 0.821 af
Outflow = 3.94 cfs @ 12.83 hrs, Volume= 0.821 af, Atten= 0%, Lag= 0.0 min
Primary = 3.94 cfs @ 12.83 hrs, Volume= 0.821 af

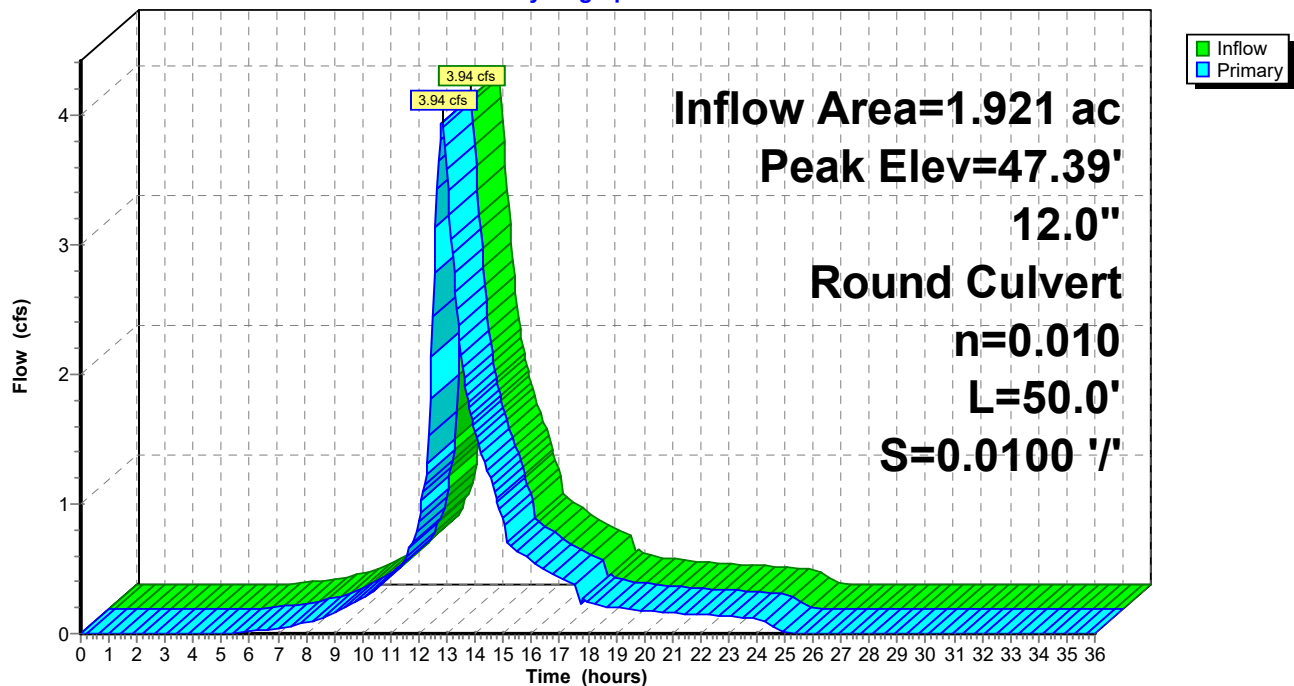
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.39' @ 12.83 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.80'	12.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.80' / 45.30' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=3.93 cfs @ 12.83 hrs HW=47.38' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 3.93 cfs @ 5.01 fps)

Pond PR-4: PR-4

Hydrograph



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Summary for Pond PR-5: PR-5

Inflow Area = 2.394 ac, 0.58% Impervious, Inflow Depth = 5.10" for 100 yr event
Inflow = 4.07 cfs @ 13.09 hrs, Volume= 1.018 af
Outflow = 4.07 cfs @ 13.09 hrs, Volume= 1.018 af, Atten= 0%, Lag= 0.0 min
Primary = 4.07 cfs @ 13.09 hrs, Volume= 1.018 af

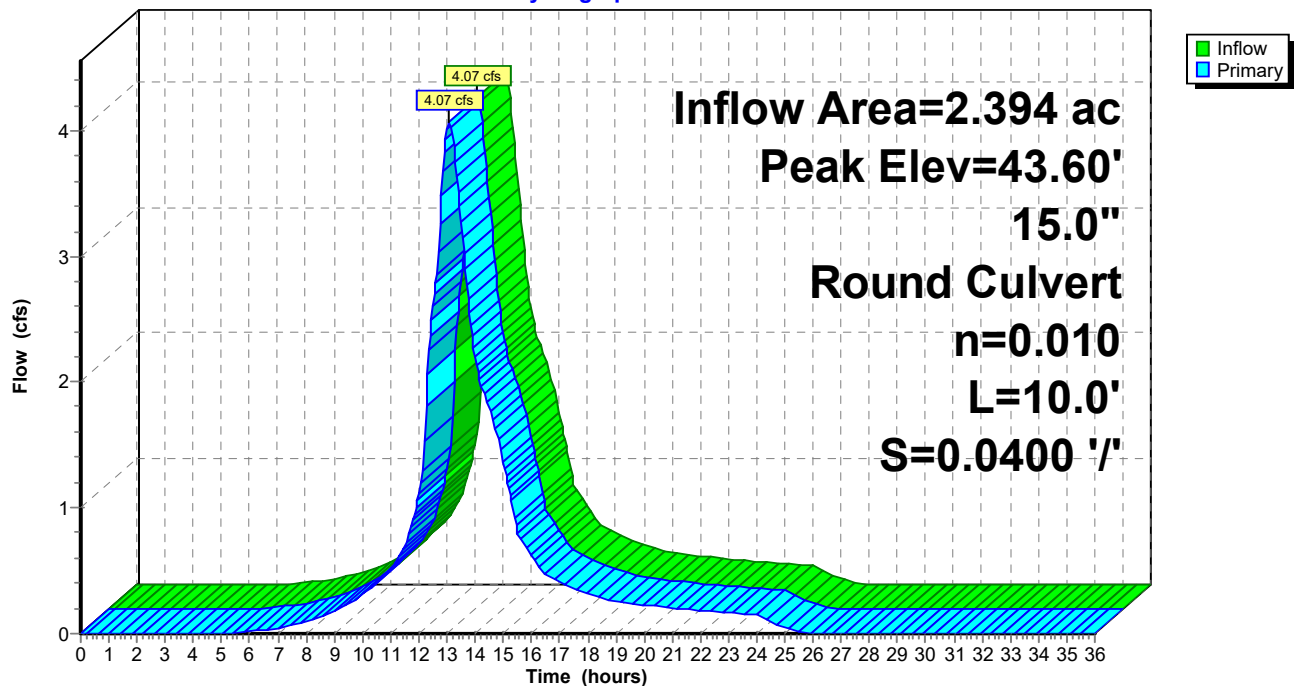
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 43.60' @ 13.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.50'	15.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.50' / 42.10' S= 0.0400 '/ Cc= 0.900 n= 0.010, Flow Area= 1.23 sf

Primary OutFlow Max=4.06 cfs @ 13.09 hrs HW=43.60' TW=0.00' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 4.06 cfs @ 3.56 fps)

Pond PR-5: PR-5

Hydrograph



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Summary for Pond SB 01 B: SB 01 B

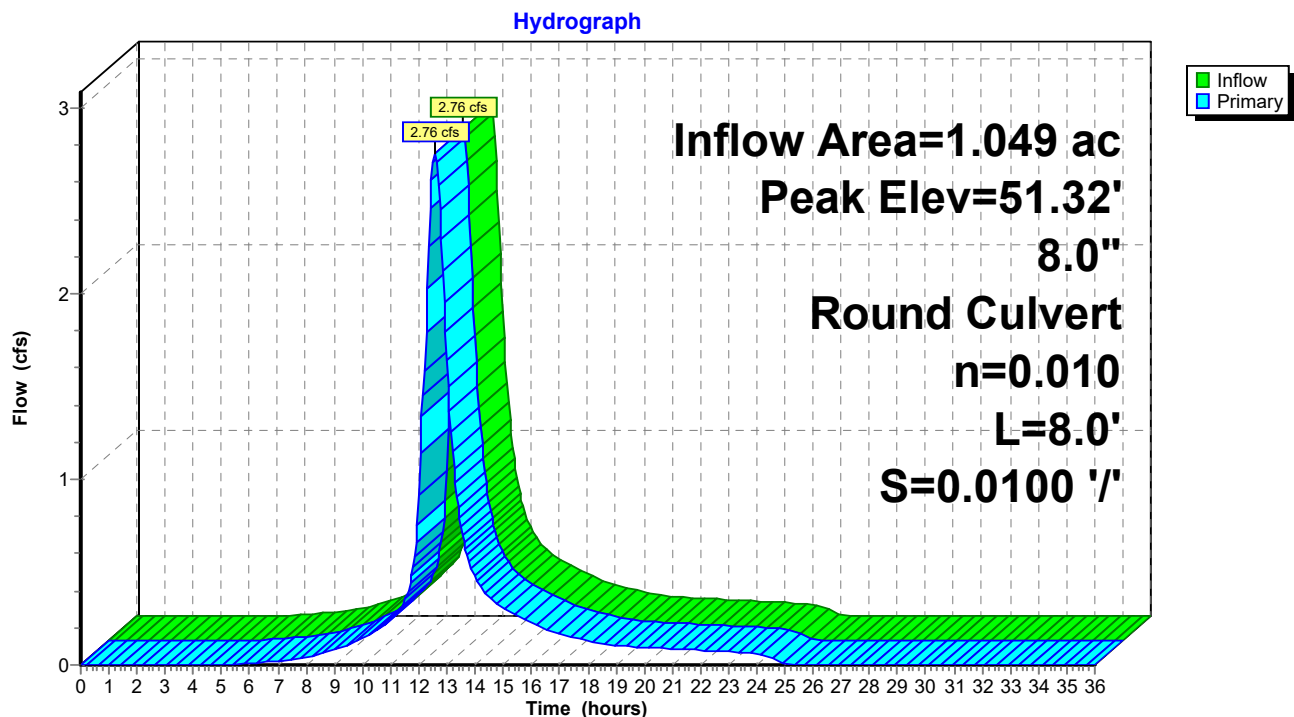
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 5.03" for 100 yr event
Inflow = 2.76 cfs @ 12.56 hrs, Volume= 0.440 af
Outflow = 2.76 cfs @ 12.56 hrs, Volume= 0.440 af, Atten= 0%, Lag= 0.0 min
Primary = 2.76 cfs @ 12.56 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 51.32' @ 12.56 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=2.75 cfs @ 12.56 hrs HW=51.31' TW=48.41' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.75 cfs @ 7.88 fps)

Pond SB 01 B: SB 01 B



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Pond SB 01 S: SB 01 S

Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 5.03" for 100 yr event
 Inflow = 2.76 cfs @ 12.56 hrs, Volume= 0.440 af
 Outflow = 1.99 cfs @ 12.87 hrs, Volume= 0.440 af, Atten= 28%, Lag= 18.3 min
 Primary = 1.99 cfs @ 12.87 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 48.98' @ 12.90 hrs Surf.Area= 0 sf Storage= 3,258 cf

Plug-Flow detention time= 16.0 min calculated for 0.439 af (100% of inflow)
 Center-of-Mass det. time= 16.0 min (846.5 - 830.5)

Volume	Invert	Avail.Storage	Storage Description
#1	46.30'	4,121 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.30	0	0
46.80	16	16
47.30	386	402
47.80	837	1,239
48.30	886	2,125
48.80	943	3,068
49.30	523	3,591
49.80	530	4,121

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	6.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.30' / 46.20' S= 0.0125 ' / ' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Primary	48.30'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.30' / 48.22' S= 0.0100 ' / ' Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=1.96 cfs @ 12.87 hrs HW=48.97' TW=47.66' (Dynamic Tailwater)

1=Culvert (Inlet Controls 1.09 cfs @ 5.53 fps)
 2=Culvert (Barrel Controls 0.87 cfs @ 3.07 fps)

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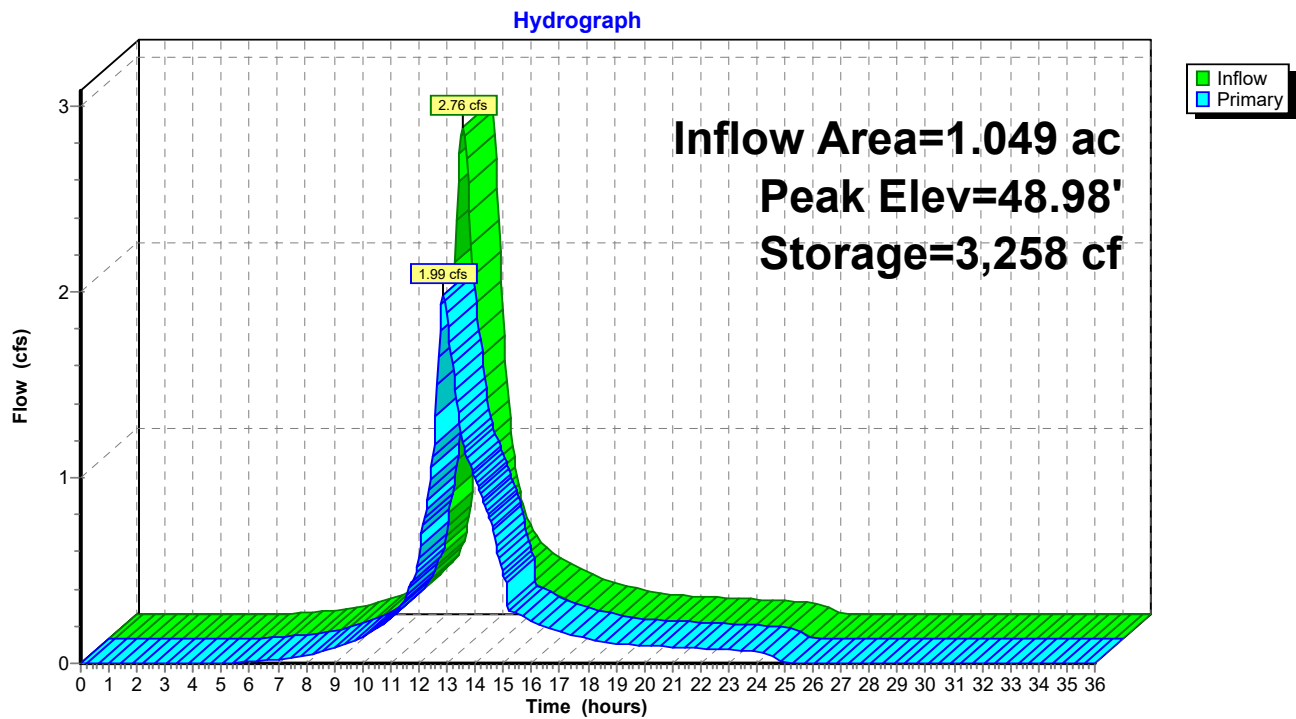
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Pond SB 01 S: SB 01 S



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Summary for Pond SB 03 B: SB 03B

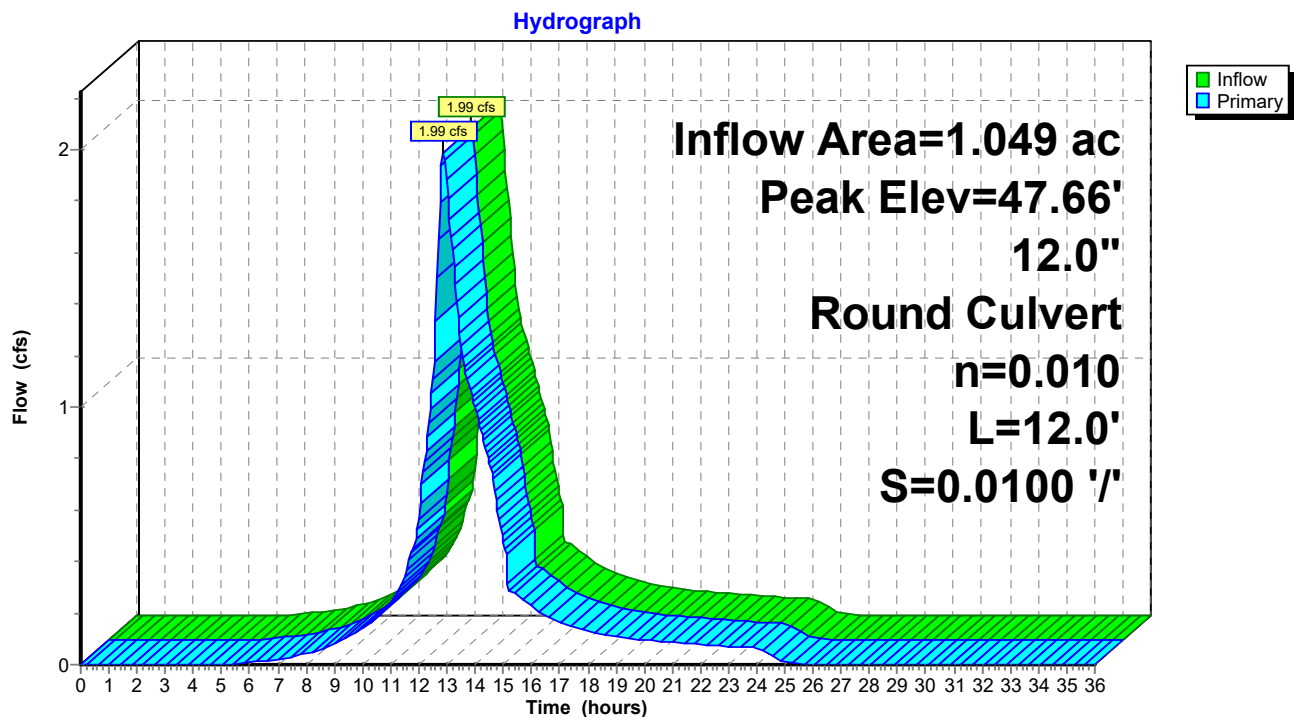
Inflow Area = 1.049 ac, 2.38% Impervious, Inflow Depth = 5.03" for 100 yr event
Inflow = 1.99 cfs @ 12.87 hrs, Volume= 0.440 af
Outflow = 1.99 cfs @ 12.87 hrs, Volume= 0.440 af, Atten= 0%, Lag= 0.0 min
Primary = 1.99 cfs @ 12.87 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.66' @ 12.88 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.25'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.25' / 46.13' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=2.02 cfs @ 12.87 hrs HW=47.66' TW=47.37' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.02 cfs @ 2.57 fps)

Pond SB 03 B: SB 03B



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Summary for Pond SB 11 B: SB 11 B

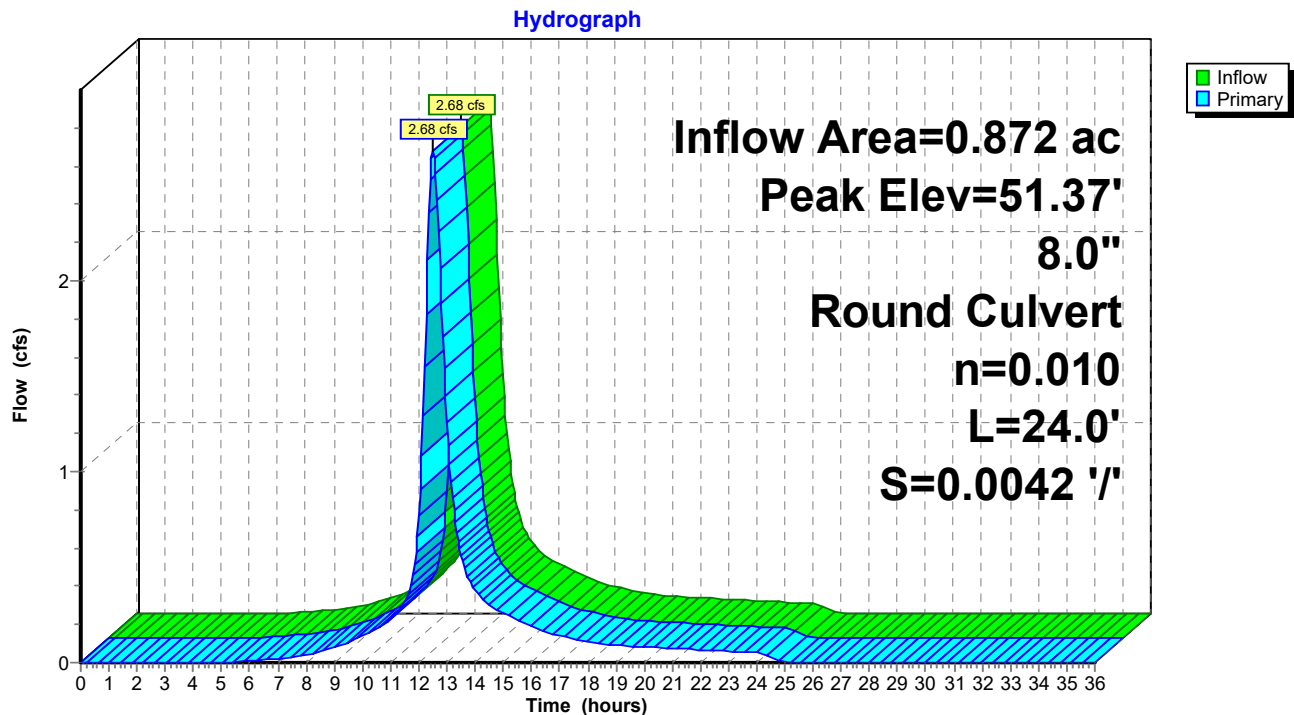
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 5.25" for 100 yr event
Inflow = 2.68 cfs @ 12.50 hrs, Volume= 0.382 af
Outflow = 2.68 cfs @ 12.50 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min
Primary = 2.68 cfs @ 12.50 hrs, Volume= 0.382 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 51.37' @ 12.50 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	48.50'	8.0" Round Culvert L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.50' / 48.40' S= 0.0042 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=2.68 cfs @ 12.50 hrs HW=51.37' TW=48.74' (Dynamic Tailwater)
↑1=Culvert (Inlet Controls 2.68 cfs @ 7.66 fps)

Pond SB 11 B: SB 11 B



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Type III 24-hr 100 yr Rainfall=7.00"

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Summary for Pond SB 11 S: SB 11 S

Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 5.25" for 100 yr event
 Inflow = 2.68 cfs @ 12.50 hrs, Volume= 0.382 af
 Outflow = 2.01 cfs @ 12.75 hrs, Volume= 0.382 af, Atten= 25%, Lag= 15.2 min
 Primary = 2.01 cfs @ 12.75 hrs, Volume= 0.382 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
 Peak Elev= 49.23' @ 12.77 hrs Surf.Area= 0 sf Storage= 3,318 cf

Plug-Flow detention time= 29.6 min calculated for 0.381 af (100% of inflow)
 Center-of-Mass det. time= 29.5 min (853.7 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	46.80'	3,953 cf	Custom Stage Data Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.80	0	0
47.30	16	16
47.80	888	904
48.30	944	1,848
48.80	1,001	2,849
49.30	544	3,393
49.80	560	3,953

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	4.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 46.72' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.09 sf
#2	Primary	48.10'	8.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 48.10' / 48.00' S= 0.0125 '/ Cc= 0.900 n= 0.010, Flow Area= 0.35 sf

Primary OutFlow Max=2.00 cfs @ 12.75 hrs HW=49.23' TW=47.81' (Dynamic Tailwater)

1=Culvert (Inlet Controls 0.50 cfs @ 5.73 fps)

2=Culvert (Inlet Controls 1.50 cfs @ 4.29 fps)

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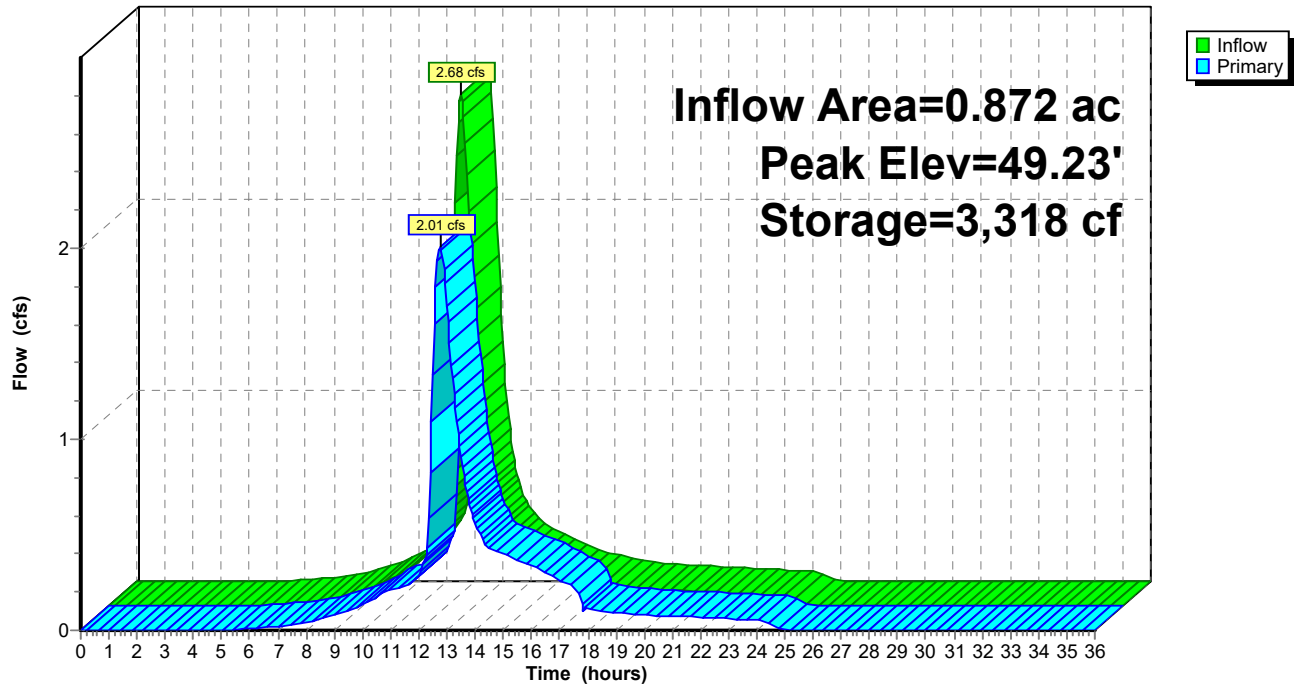
Type III 24-hr 100 yr Rainfall=7.00"

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Pond SB 11 S: SB 11 S

Hydrograph



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Summary for Pond SB 12 B: SB 12 B

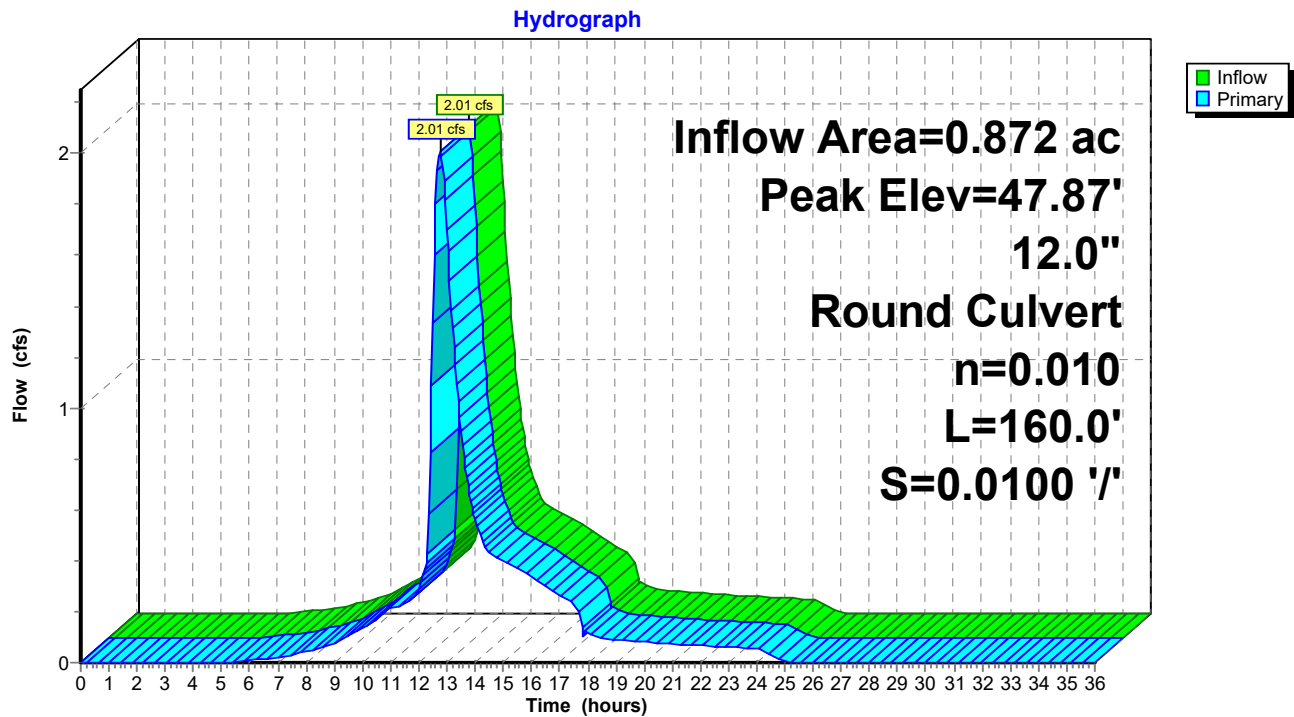
Inflow Area = 0.872 ac, 0.00% Impervious, Inflow Depth = 5.25" for 100 yr event
Inflow = 2.01 cfs @ 12.75 hrs, Volume= 0.382 af
Outflow = 2.01 cfs @ 12.75 hrs, Volume= 0.382 af, Atten= 0%, Lag= 0.0 min
Primary = 2.01 cfs @ 12.75 hrs, Volume= 0.382 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 47.87' @ 12.86 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.80'	12.0" Round Culvert L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.80' / 45.20' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.86 cfs @ 12.75 hrs HW=47.81' TW=47.32' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 1.86 cfs @ 2.90 fps)

Pond SB 12 B: SB 12 B



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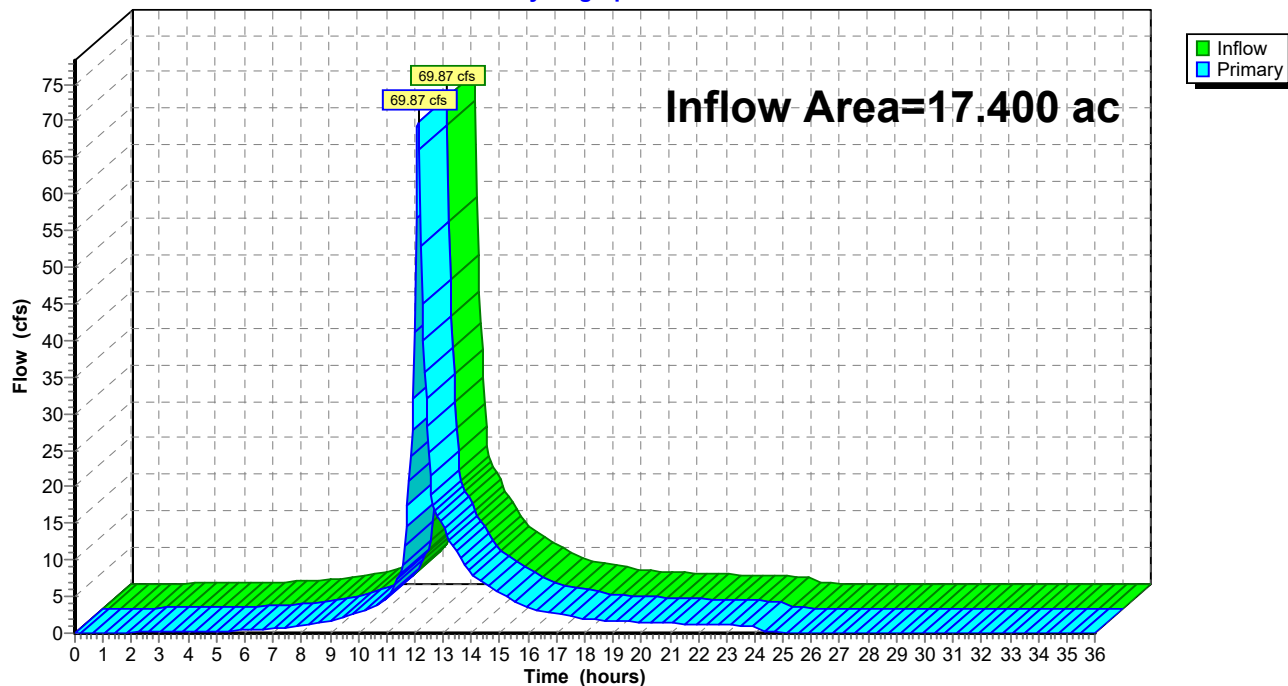
Summary for Link POA: POA

Inflow Area = 17.400 ac, 49.60% Impervious, Inflow Depth > 5.15" for 100 yr event
Inflow = 69.87 cfs @ 12.11 hrs, Volume= 7.475 af
Primary = 69.87 cfs @ 12.11 hrs, Volume= 7.475 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Link POA: POA

Hydrograph



APPENDIX 3:
Test Pit Logs
Soils Report



Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Town of Arlington

Owner Name

869 Massachusetts Ave

Street Address

Arlington

City

MA

State

53-2-4

Map/Lot #

02476

Zip Code

B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes:

USDA
Source

656
Soil Map Unit

Udorthents

Soil Name

Soil Limitations

Loamy alluvium and/or sandy glaciofluvial deposits
and/or loamy glaciolacustrine deposits

Urban Land
Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No

If yes: 2018/Stone
Year Published/Source

Artificial Fill
Map Unit

Earth materials and manmade materials that have been artificially emplaced.

Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No

If yes, MassGIS Wetland Data Layer: N/A
Wetland Type

7. Current Water Resource Conditions (USGS):

1015/19
Month/Day/ Year

Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:



Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-1 10/14/19 11:00 Sunny, 50's _____
Hole # Date Time Weather Latitude Longitude:
1. Land Use Landscaped area Grass None _____
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
Description of Location: _____

2. Soil Parent Material: Loamy alluvium Outwash plain BS
Landform Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body 100'+ feet Drainage Way 100'+ feet Wetlands 100'+ feet
Property Line 20'+ feet Drinking Water Well 100'+ feet Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 90" Depth Weeping from Pit 96" Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-36	Fill										
36-48	Ab	Sandy Loam	10YR3/1						Granular	Friable	
48-96	C1	Sandy Loam	2.5Y 5/4				3%	3%	Massive	Friable	

Additional Notes:

NRCS Hydrologic Soil Group B; ESHGW=37.00



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number:

Hole #

Date

Time

Weather

Latitude

Longitude:

1. Land Use: (e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location:

2. Soil Parent Material: Landform Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body _____ feet Drainage Way _____ feet Wetlands _____ feet
Property Line _____ feet Drinking Water Well _____ feet Other _____ feet

4. Unsuitable

Materials Present: ☐ Yes ☐ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☐ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

☐ Depth observed standing water in observation hole

Obs. Hole # TP-1

Obs. Hole # _____

_____ inches

_____ inches

☒ Depth weeping from side of observation hole

90" inches

_____ inches

☐ Depth to soil redoximorphic features (mottles)

_____ inches

_____ inches

☐ Depth to adjusted seasonal high groundwater (S_h)
(USGS methodology)

_____ inches

_____ inches

Index Well Number _____

Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: 90" inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)?

Upper boundary: 48"
inches

Lower boundary: 96"
inches

c. If no, at what depth was impervious material observed?

Upper boundary: _____
inches

Lower boundary: _____
inches



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

David Scharlacken

Signature of Soil Evaluator

David Scharlacken SE#14279

Typed or Printed Name of Soil Evaluator / License #

10-15-19

Date

12/1/2021

Expiration Date of License

Name of Approving Authority Witness

Approving Authority

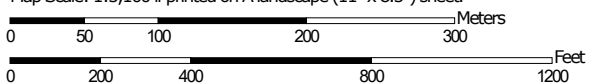
Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with [Percolation Test Form 12](#).

Field Diagrams: Use this area for field diagrams:

Hydrologic Soil Group—Middlesex County, Massachusetts



Map Scale: 1:5,100 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

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Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

8/21/2019
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
 Survey Area Data: Version 18, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
602	Urban land		44.3	33.9%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	20.3	15.5%
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	A	18.5	14.1%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	A	17.4	13.3%
655	Udorthents, wet substratum		11.1	8.5%
656	Udorthents-Urban land complex		19.1	14.6%
Totals for Area of Interest			130.7	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX 4:
Operations and Maintenance Plan

**ARLINGTON HIGH SCHOOL
CONSTRUCTION PERIOD POLLUTION PREVENTION PLAN AND EROSION CONTROL
OPERATION AND MAINTENANCE PLAN
MAY 2020**

During The Construction Period the General Contractor shall be responsible for the following:

1. Erosion Control

Erosion control barriers will be placed along down-gradient portion of the site as indicated on the project plans. Additional erosion control barriers will be placed at the limit of work as needed and in any sensitive areas as work progresses.

A stockpile of additional erosion control barriers shall be kept on site at all times

2. Site Access

Site access, for construction equipment will be from Massachusetts Ave. and Mill Brook Drive via an existing access drive as shown on the phased Demolition and Soil Erosion Plans, and all construction entrances will be installed at the onset of the project.

3. Construction Staging

A construction staging area will be established by the Contractor.

4. Site Grading/Site Work

The site activities may only commence when the site is stable from erosion and all required control measures are in place and functional.

5. Slope Stabilization

All surfaces and slopes shall be checked at least once every 7 calendar days and within 24 hours of the occurrence of a storm event 0.25 inches or greater to see that vegetation is in good condition. Any rills or damage from erosion shall be repaired immediately to avoid further damage. If seeps develop on the slopes, the area will be evaluated to determine if the seep will cause an unstable condition and shall be stabilized immediately if necessary. Problems found during the inspections by the General Contractor shall be repaired promptly. Areas requiring re-vegetation shall be replanted immediately or stabilized in a manner acceptable to the Conservation Commission if it is outside of the growing season. Slopes and other exposed surfaces receiving vegetation will be maintained as necessary to support healthy vegetation. If stabilization is required during the non-growing season, straw mulch, or a commercially manufactured blanket must be employed to prevent erosion.

6. Permanent Stabilization

Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed no later than 14 days after the last construction activity. The permanent seed mix, fertilizer, and mulch shall be specified on the project plans. Permanent seeding shall occur in the Spring or Fall.

7. Drainage Structures (Catch Basins, Area Drains, Manholes, WQU's)

All structures shall be inspected on a bi-weekly basis and/or after every rain storm and repairs made as necessary. Sediment shall be removed from the sump after the sediment has reached a maximum of one half the depth of the sump. The sediment shall be removed from the site and properly disposed of. Drainage structures/sumps shall be cleaned completely at the end of construction.

8. Dust and Sediment Control

Siltsacks:

Catch basin/Area drain filters shall be placed at all inlets to drainage structures as structures are installed and prior to pavement removal. Outlet protection work shall be constructed before runoff is allowed to enter the drainage system. Construction and location of catch basin filters shall be as indicated on the Drawings.

Straw Wattles:

Straw bales shall be installed as indicated on the Drawings.

Bales shall be placed in a row with ends tightly abutting the adjacent wattles. Each roll shall be securely anchored in place by 2 stakes or re-bars driven through the wattles. The first stake in each roll shall be angled toward the previously laid straw wattle to force them together.

Construction Entrance:

The area of the construction entrance should be cleared of all vegetation, roots, and other objectionable material. The filter fabric should be placed on the subgrade prior to the gravel placement. The gravel shall be placed to the specified dimensions depicted on the plans.

The Construction entrance shall be a minimum of 50-feet in length and 20-feet wide.

Dust Control:

A mechanical street sweeper shall be utilized to clean the existing paved areas on an as-needed basis.

For emergency control of dust apply water to affected areas. The source of supply and the method of application for water are the responsibility of the contractor.

Pollution Prevention Measures

1. Before, during, and after construction, functional erosion and sedimentation controls shall be implemented to prevent the silting of the wetland areas down-gradient of the site. Straw bales, crushed stone, temporary stabilization and other controls shall be properly maintained and are not to be removed until the site is permanently stabilized. Other controls shall be added as warranted during construction to protect environmentally-sensitive areas. Sufficient extra materials (e.g. straw bales and other control materials) shall be stored on site for emergencies.
2. Silt sacks and straw bale check dams shall be installed at all existing and proposed infiltration areas to protect from soils and sediment.
3. Casting of excavated materials shall be stored away from wetland areas and sensitive land areas.
4. Any stockpiling of loose materials shall be properly stabilized to prevent erosion and siltation. Preventative controls such as straw wattles, temporary seeding/mulching and jute covering shall be implemented to prevent such an occurrence.
5. There shall be no flooding, ponding, or flood related damage caused by the project or surface run-off emanating from the project on lands of an abutter, nearby or down-gradient of the site.

6. There shall be no contaminant migration caused by the project to nearby and down-gradient properties, nearby aquifers, and nearby resource areas.
7. The contractor shall make sufficient provisions to control any unexpected drainage and erosion conditions that may arise during construction that may create damage on abutting properties. Said control measures are to be implemented at once.
8. During construction flood prevention, erosion, and sedimentation controls shall be in place before the natural ground cover is disturbed. Said controls shall be in place prior to other construction work and shall be monitored and approved by the Contractor. They shall be properly maintained and are not to be removed until the site is stabilized.
9. The Contractor shall designate a person or persons to inspect and supervise the erosion controls for the project. The Conservation Commission shall be notified as to the means to contact said individual or individuals on a 24-hour basis on all working and non-working days of the project. Said means of contact shall include at least 2 separate telephone number of said designated person or persons.
10. There shall be periodic inspection of straw wattles, and other erosion controls by the Contractor's Designee to assure their continued effectiveness.
11. The Contractor shall make adequate provisions for controlling erosion and sediment from activities that might yield water at high volumes with high suspended solid contents, such as dewatering excavations.
12. Street sweeping shall be used to keep public ways free and clear of sediment and dirt from the site activities.

Other Control Measures

Waste Materials. All trash and construction debris from the site will be hauled to an approved landfill or recycling facility. No construction waste material will be buried on the site. All personnel will receive instructions regarding the correct procedure for waste disposal. Notices describing these practices will be posted in the construction office. The site superintendent will be responsible for seeing that these procedures are followed. Employee waste and other loose materials will be collected so as to prevent the release of floatables during rainfall events.

Hazardous Waste. No Hazardous materials are expected to be encountered. The mandated State and Local permits for removal of such materials, if located, will be implemented when such materials are encountered.

After Construction, the owner shall be responsible for the following:

General Land Grading and Slopes Stabilization

All surfaces and slopes shall be checked bi-annually to see that vegetation is in good condition. Any rills or damage from erosion shall be repaired immediately to avoid further damage. If seeps develop on the slopes, the area will be evaluated to determine if the seep will cause an unstable condition and shall be stabilized immediately if necessary. Problems found during the inspections by the Owner shall be repaired promptly. Areas requiring re-vegetation shall be replanted immediately. Slopes and other exposed surfaces receiving vegetation will be maintained as necessary to support healthy vegetation.

Areas of steep slopes (2.5:1 or greater) shall be stabilized using jute mesh or a similar approved erosion blanket.

Erosion Controls

Erosion controls shall not be removed or dismantled without approval from the Engineer or Conservation Commission. Sediment deposits that are removed or left in place after the barriers have been dismantled shall be graded manually to conform to the existing topography and vegetated using seeding or other long term cover as approved in the Landscape Plan. Bare ground that cannot be permanently stabilized within 30 days shall be stabilized by temporary measures.

Street Sweeping (\$500 per sweeping)

It is proposed that the parking and drive areas be swept with a wet brush street sweeper on a semi-annual basis, with at least two sweepings per year. One sweep shall be done at the end of the winter season (prior to the heavy rains), and the other sweep at the end of autumn (prior to snowfall).

Stormwater Management System

Catch Basins, Area Drains, and Drain Manholes (\$500 per CB structure per inspection/cleaning):

The catch basins, drain manholes, WQU's, infiltration systems, and area drains shall be inspected semi-annually, and cleaned out when sumps are approximately one foot full. The use of "clam shells" for sediment removal shall not be allowed; a vacuum truck shall be the approved method of cleaning. Integrity and functionality of oil hoods shall also be checked at the time of the inspection.

Water Quality Unit (WQU) (\$1000 per structure per inspection/cleaning):

Water Quality Unit shall be as follows and per manufacturer's recommendations:

- Units should be inspected post-construction, prior to being put into service.
- Inspect every six months for the first year of operation to determine the oil and sediment accumulation rate. In subsequent years, inspections can be based on first-year observations
- Cleaning is required once the sediment depth reaches 15% of storage capacity, (generally taking one year or longer).
- Inspect the unit immediately after an oil, fuel or chemical spill.
- A licensed waste management company should remove captured petroleum waste products from any oil, chemical or fuel spills and dispose responsibly

Rain Garden (\$750 per cleaning):

Inspection and Maintenance of Rain Gardens shall be conducted per the Bioretention Maintenance Schedule provided below from the Massachusetts Stormwater Handbook:

Bioretention Maintenance Schedule		
<i>Activity</i>	<i>Time of Year</i>	<i>Frequency</i>
Inspect & remove trash	Year round	Monthly
Mulch	Spring	Annually
Remove dead vegetation	Fall or Spring	Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace entire media & all vegetation	Late Spring/early Summer	As needed*

** Paying careful attention to pretreatment and operation & maintenance can extend the life of the soil media*
Structural BMPs - Volume 2 | Chapter 2 page 27

Infiltration System (\$2,500 per cleaning; \$1,000 per inspection)

The proposed infiltration system shall be inspected semi-annually, and shall follow the suggested schedule for routine maintenance during the regular operation of the stormwater system:

Inlets and Outlets	Every 3 years	<ul style="list-style-type: none"> Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	<ul style="list-style-type: none"> Check inlet and outlets for clogging and remove any debris as required.
Stormwater Chambers	2 years after commissioning	<ul style="list-style-type: none"> Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	<ul style="list-style-type: none"> Clean stormwater management chambers and feed connectors of any debris. Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	<ul style="list-style-type: none"> Clean stormwater management chambers and feed connectors of any debris. Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. Attain the appropriate approvals as required. Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1 st year	<ul style="list-style-type: none"> Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	<ul style="list-style-type: none"> Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	<ul style="list-style-type: none"> Confirm that no unauthorized modifications have been performed to the site.

Maintenance and Emergency Repairs

Any maintenance or emergency repairs to the system will be the responsibility of the Owner.

INSPECTION REPORT FORM FOR STORM WATER SYSTEM

Project: Arlington High School, Arlington, MA
869 Massachusetts Avenue, Arlington, MA 02476

INSPECTOR: _____ **DATE:** _____

Regular Inspection: ☐
Inspection after Rainfall: ☐ **Amount of Rainfall:** _____ inches

BMP	Functioning Correctly	Notes/Action Taken
	Y/N	
	Y/N	
	Y/N	
	Y/N	
	Y/N	
	Y/N	
	Y/N	

Additional Observations: _____

Action Required: _____

To be performed by: _____ **On or Before:** _____

APPENDIX 5:

Calculations

5/7/2020

SEGMENT			WATERSHED CHARACTERISTICS						PIPE CHARACTERISTICS				MANNING'S VALUES					
No.	Start	End	Design Frequency						25-year				Pipe Design Depth				Head above invert	Velocity
			Drain. Area	Runoff Coeff.	Time of Conc.	Rainfall Intens.	Q (min) CiA	Pipe Diameter D	Pipe Material	Pipe Length	Pipe Slope	n	A	R	Q (max)			
																acres		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
1	CB1	DMH1	0.123	0.95	6.0	5.90	0.70	12	HDPE	177	0.015	0.011	0.785	0.250	5.17	-	0.0 fps	
2	CB2	DMH1	0.117	0.95	6.0	5.90	0.66	12	HDPE	6	0.010	0.011	0.785	0.250	4.22	-	3.6 fps	
3	CB3	DMH12	0.443	0.58	6.0	5.90	1.54	12	HDPE	171	0.005	0.011	0.785	0.250	2.99	-	4.0 fps	
4	CB4	RG2	0.372	0.95	6.0	5.90	2.31	12	HDPE	128	0.050	0.011	0.785	0.250	9.44	-	9.4 fps	
5	CB5	DMH3	0.474	0.90	6.0	5.90	2.53	12	HDPE	183	0.050	0.010	0.785	0.250	10.38	-	11.5 fps	
6	CB6	DMH11	0.305	0.80	6.0	5.90	1.45	12	HDPE	52	0.042	0.011	0.785	0.250	8.65	-	7.7 fps	
7	CB7	DMH11	0.641	0.94	6.0	5.90	3.57	12	HDPE	60	0.009	0.011	0.785	0.250	4.01	-	5.1 fps	
8	CB8	WQU1	0.200	0.95	6.0	5.90	1.13	12	HDPE	11	0.020	0.011	0.785	0.250	5.97	-	7.6 fps	
9	CB9	WQU1	0.157	0.80	6.0	5.90	0.74	12	HDPE	76	0.010	0.011	0.785	0.250	4.22	-	5.4 fps	
10	CB10	DMH3	0.502	0.86	6.0	5.90	2.57	12	HDPE	21	0.030	0.011	0.785	0.250	7.31	-	9.3 fps	
11	CB11	DMH5	0.727	0.57	6.0	5.90	2.49	12	HDPE	47	0.010	0.011	0.785	0.250	4.22	-	5.4 fps	
12	CB12	DMH7	1.070	0.70	6.0	5.90	4.43	12	HDPE	46	0.020	0.011	0.785	0.250	5.97	-	7.6 fps	
13	CB13	MILL BRK	0.309	0.84	6.0	5.90	1.55	12	HDPE	45	0.030	0.011	0.785	0.250	7.31	-	9.3 fps	
14	TD-2	DMH2	0.237	0.92	6.0	5.90	1.29	12	HDPE	107	0.010	0.011	0.785	0.250	4.22	-	5.4 fps	
15	AD-3	DMH1	0.101	0.42	6.0	5.90	0.25	8	HDPE	48	0.005	0.011	0.349	0.167	1.01	-	2.9 fps	
16	AD-5	DMH4	0.034	0.95	6.0	5.90	0.19	8	HDPE	20	0.100	0.011	0.349	0.167	4.53	-	13.0 fps	
17	AD-6	DMH4	0.046	0.52	6.0	5.90	0.14	8	HDPE	5	0.010	0.011	0.349	0.167	1.43	-	4.1 fps	
18	AD-7	DMH5	0.023	0.25	6.0	5.90	0.03	8	HDPE	12	0.010	0.011	0.349	0.167	1.43	-	4.1 fps	
19	RD-1	DMH13	0.656	0.95	6.0	5.90	3.71	12	HDPE	150	0.010	0.011	0.785	0.250	4.22	-	5.4 fps	
20	RD-2	DMH13	0.576	0.95	6.0	5.90	3.25	12	HDPE	14	0.025	0.011	0.785	0.250	6.68	-	8.5 fps	
21	RD-3	DMH8	0.232	0.95	6.0	5.90	1.31	10	HDPE	20	0.030	0.011	0.545	0.208	4.50	-	8.2 fps	
22	RD-4	DMH6	0.862	0.95	6.0	5.90	4.87	12	HDPE	52	0.020	0.011	0.785	0.250	5.97	-	7.6 fps	
23	RD-5	DMH5	0.709	0.95	6.0	5.90	4.01	12	HDPE	49	0.010	0.011	0.785	0.250	4.22	-	5.4 fps	
24	RD-6	DMH4	0.333	0.95	6.0													

[illegible]

17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 100 yr Rainfall=7.00"

Prepared by Samiotes Engineering

Printed 5/7/2020

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Page 1

Stage-Area-Storage for Pond 1P: rain garden#1 cascading

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	
58.50	150	0	61.10	263	206	
58.55	150	3	61.15	276	220	
58.60	150	6	61.20	289	234	
58.65	150	9	61.25	303	249	
58.70	150	12	61.30	316	264	
58.75	150	15	61.35	329	280	
58.80	150	18	61.40	343	297	
58.85	150	21	61.45	356	315	
58.90	150	24	61.50	370	333	STATIC STORAGE
58.95	150	27	61.55	383	352	
59.00	150	30	61.60	396	371	
59.05	150	32	61.65	410	391	
59.10	150	34	61.70	423	412	
59.15	150	36	61.75	436	434	
59.20	150	38	61.80	450	456	
59.25	150	39	61.85	463	479	
59.30	150	41	61.90	476	502	
59.35	150	43	61.95	490	526	
59.40	150	45	62.00	503	551	
59.45	150	47	62.05	511	576	
59.50	150	49	62.10	519	602	
59.55	150	51	62.15	527	628	
59.60	150	53	62.20	534	655	
59.65	150	54	62.25	542	682	
59.70	150	56	62.30	550	709	
59.75	150	58	62.35	558	737	
59.80	150	60	62.40	566	765	
59.85	150	62	62.45	574	793	
59.90	150	64	62.50	582	822	
59.95	150	66	62.55	589	851	
60.00	150	68	62.60	597	881	
60.05	150	69	62.65	605	911	
60.10	150	71	62.70	613	942	
60.15	150	73	62.75	621	972	
60.20	150	75	62.80	629	1,004	
60.25	150	77	62.85	636	1,035	
60.30	150	79	62.90	644	1,067	
60.35	150	80	62.95	652	1,100	
60.40	150	82	63.00	660	1,132	
60.45	150	83				
60.50	150	85				
60.55	159	93				
60.60	167	101				
60.65	176	109				
60.70	184	118				
60.75	193	128				
60.80	202	138				
60.85	210	148				
60.90	219	159				
60.95	227	170				
61.00	236	181				
61.05	249	194				

17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 100 yr Rainfall=7.00"

Prepared by Samiotes Engineering

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Page 2

Stage-Area-Storage for Pond 2P: rain garden#2 cascading

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	
51.00	400	0	53.60	576	520	
51.05	400	8	53.65	591	549	
51.10	400	16	53.70	606	579	
51.15	400	24	53.75	621	609	STATIC STORAGE
51.20	400	32	53.80	635	641	
51.25	400	40	53.85	650	673	
51.30	400	48	53.90	665	706	
51.35	400	56	53.95	679	739	
51.40	400	64	54.00	694	774	
51.45	400	72	54.05	726	809	
51.50	400	80	54.10	757	846	
51.55	400	85	54.15	789	885	
51.60	400	90	54.20	820	925	
51.65	400	95	54.25	852	967	
51.70	400	100	54.30	884	1,010	
51.75	400	105	54.35	915	1,055	
51.80	400	110	54.40	947	1,102	
51.85	400	115	54.45	978	1,150	
51.90	400	120	54.50	1,010	1,200	
51.95	400	125	54.55	1,042	1,251	
52.00	400	130	54.60	1,073	1,304	
52.05	400	135	54.65	1,105	1,358	
52.10	400	140	54.70	1,136	1,414	
52.15	400	145	54.75	1,168	1,472	
52.20	400	150	54.80	1,200	1,531	
52.25	400	155	54.85	1,231	1,592	
52.30	400	160	54.90	1,263	1,654	
52.35	400	165	54.95	1,294	1,718	
52.40	400	170	55.00	1,326	1,784	
52.45	400	175				
52.50	400	180				
52.55	400	185				
52.60	400	190				
52.65	400	195				
52.70	400	200				
52.75	400	205				
52.80	400	210				
52.85	400	215				
52.90	400	219				
52.95	400	223				
53.00	400	227				
53.05	415	247				
53.10	429	268				
53.15	444	290				
53.20	459	312				
53.25	474	336				
53.30	488	360				
53.35	503	385				
53.40	518	410				
53.45	532	436				
53.50	547	463				
53.55	562	491				

17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 100 yr Rainfall=7.00"

Prepared by Samiotes Engineering

Printed 5/7/2020

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Page 3

Stage-Area-Storage for Pond 3P: rain garden#3 cascading

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	
46.00	600	0	48.60	814	764	
46.05	600	12	48.65	832	805	
46.10	600	24	48.70	850	847	
46.15	600	36	48.75	868	890	STATIC STORAGE
46.20	600	48	48.80	886	934	
46.25	600	60	48.85	903	979	
46.30	600	72	48.90	921	1,024	
46.35	600	84	48.95	939	1,071	
46.40	600	96	49.00	957	1,118	
46.45	600	108	49.05	978	1,167	
46.50	600	120	49.10	999	1,216	
46.55	600	127	49.15	1,019	1,267	
46.60	600	135	49.20	1,040	1,318	
46.65	600	142	49.25	1,061	1,371	
46.70	600	150	49.30	1,082	1,424	
46.75	600	158	49.35	1,103	1,479	
46.80	600	165	49.40	1,123	1,534	
46.85	600	173	49.45	1,144	1,591	
46.90	600	180	49.50	1,165	1,649	
46.95	600	188	49.55	1,186	1,708	
47.00	600	195	49.60	1,207	1,767	
47.05	600	202	49.65	1,227	1,828	
47.10	600	210	49.70	1,248	1,890	
47.15	600	217	49.75	1,269	1,953	
47.20	600	225	49.80	1,290	2,017	
47.25	600	233	49.85	1,311	2,082	
47.30	600	240	49.90	1,331	2,148	
47.35	600	248	49.95	1,352	2,215	
47.40	600	255	50.00	1,373	2,283	
47.45	600	263				
47.50	600	270				
47.55	600	277				
47.60	600	285				
47.65	600	292				
47.70	600	300				
47.75	600	308				
47.80	600	315				
47.85	600	322				
47.90	600	328				
47.95	600	334				
48.00	600	340				
48.05	618	370				
48.10	636	402				
48.15	654	434				
48.20	671	467				
48.25	689	501				
48.30	707	536				
48.35	725	572				
48.40	743	608				
48.45	761	646				
48.50	779	685				
48.55	796	724				

17211.00 Arlington HS - Proposed Conditions

Type III 24-hr 100 yr Rainfall=7.00"

Prepared by Samiotes Engineering

Printed 5/7/2020

HydroCAD® 10.00-24 s/n 03575 © 2018 HydroCAD Software Solutions LLC

Page 4

Stage-Area-Storage for Pond 4P: UGS-1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
39.50	1,672	0	44.70	1,672	5,122
39.60	1,672	59	44.80	1,672	5,180
39.70	1,672	117	44.90	1,672	5,239
39.80	1,672	176	45.00	1,672	5,297
39.90	1,672	234			
40.00	1,672	293			
40.10	1,672	351			
40.20	1,672	410			
40.30	1,672	508			
40.40	1,672	645			
40.50	1,672	783			
40.60	1,672	919			
40.70	1,672	1,055			
40.80	1,672	1,190			
40.90	1,672	1,325			
41.00	1,672	1,459			
41.10	1,672	1,592			
41.20	1,672	1,724			
41.30	1,672	1,855			
41.40	1,672	1,986			
41.50	1,672	2,116			
41.60	1,672	2,244			
41.70	1,672	2,372			
41.80	1,672	2,498			
41.90	1,672	2,623			
42.00	1,672	2,747			
42.10	1,672	2,870			
42.20	1,672	2,991			
42.30	1,672	3,110			
42.40	1,672	3,228			
42.50	1,672	3,344			
42.60	1,672	3,458			
42.70	1,672	3,570			
42.80	1,672	3,680			
42.90	1,672	3,788			
43.00	1,672	3,893			
43.10	1,672	3,995			
43.20	1,672	4,094			
43.30	1,672	4,190			
43.40	1,672	4,282			
43.50	1,672	4,369			
43.60	1,672	4,449			
43.70	1,672	4,522			
43.80	1,672	4,588			
43.90	1,672	4,652			
44.00	1,672	4,712			
44.10	1,672	4,771			
44.20	1,672	4,829			
44.30	1,672	4,888			
44.40	1,672	4,946			
44.50	1,672	5,005			
44.60	1,672	5,063			

STATIC
STORAGE

ARLINGTON HIGH SCHOOL CULVERT RELOCATION

Existing Culvert:

In the existing condition there is a large culvert, consisting of a 36" reinforced concrete pipe (RCP), that flows under the existing building and discharges to the Mill Brook culvert. This culvert carries a large watershed from South of the project site which measures 4,626,374 sf (106.20 Ac). Historically this culvert has been shown to be undersized and has caused flooding and foloor buckling within the basement of the high school and will be relocated and improved under post construction conditions while keeping the flow rates equal to the existing flow rates so that the stormwater doesn't impact areas downstream.

Results/ Summary

Through the use of the rational method to anticipate pipe discharge rates, both the existing and proposed culvert were modeled to show flows for the 25 year storm event.

The watershed that contributes to the culvert is large and holds approximately 40.36 acres, as shown in the chart entitled WATERSHED DRAINAGE CALCULATIONS below.

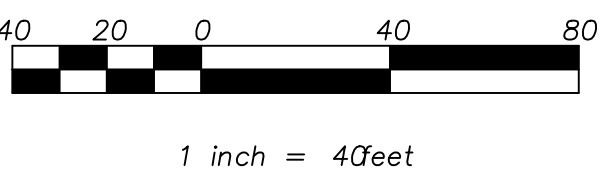
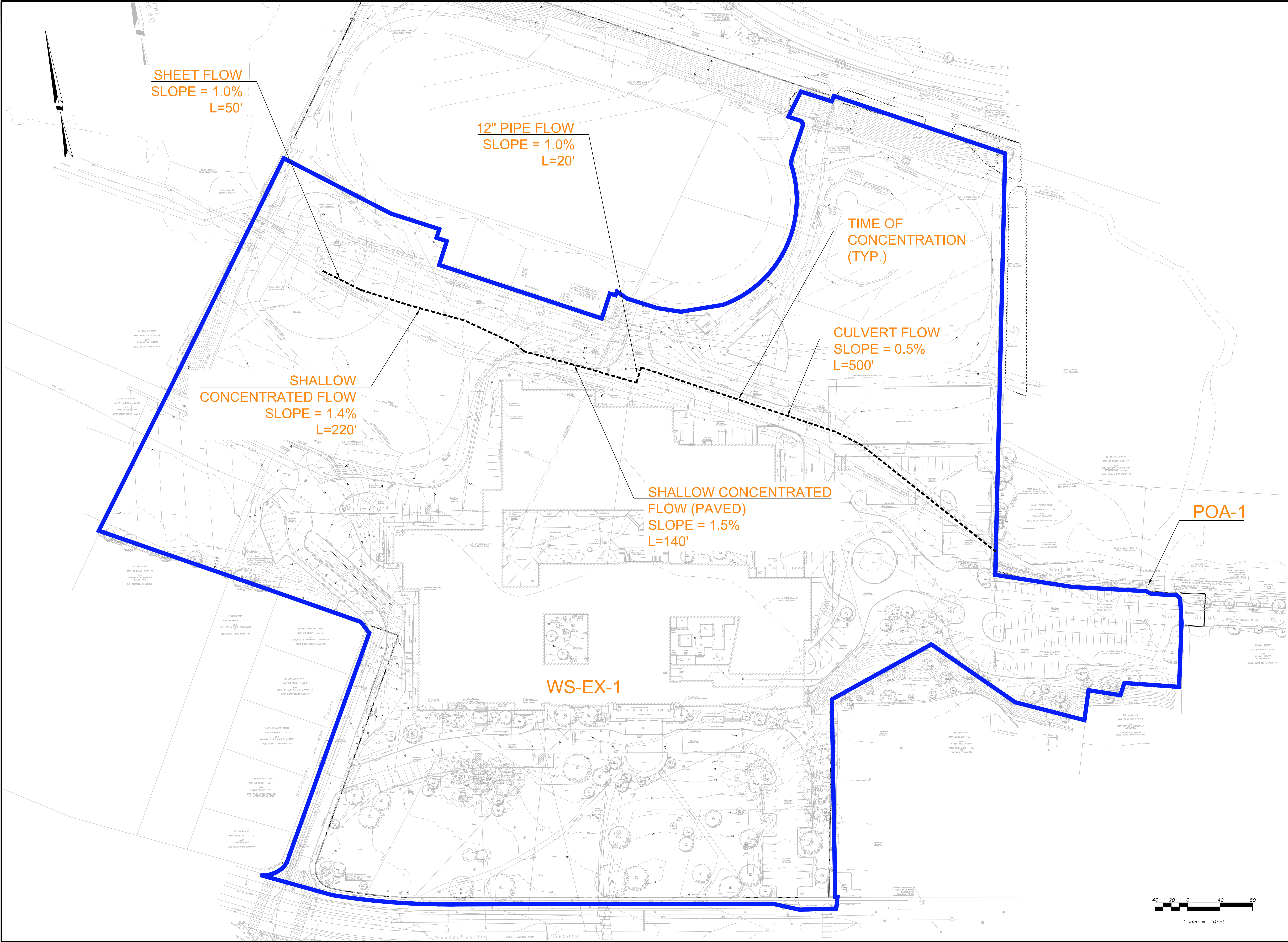
WATERSHED DRAINAGE CALCULATIONS											
LOCATION	IMPERVIOUS AREA		OTHER		SUM		I	Q		DESIGN PERIOD	
FROM	TO	A (Ac)	C	CA	A (Ac)	C	CA	Tc	(in/hr)	IxCA	25-YEAR
Watershed	Culvert	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47

As shown in Table 1, the post development flows are similar to the pre-development flows so that the new culvert will not have an adverse effect to downstream areas.

Existing Culvert 36" RCP											
Ex. MH	Pipe Bend	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
Pipe Bend	Ex. MH 1	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
	Site Area 1	0.47	0.9	0.42	1.07	0.3	0.32	0.74	11.6	6.0	
Ex. MH 1	Ex. MH 2	40.83	0.9	36.75	66.92	0.3	20.08	56.82	11.6	6.0	340.94
Ex. MH 2	Ex. MH 3	40.83	0.9	36.75	66.92	0.3	20.08	56.82	11.6	6.0	340.94
	Site Area 2	0.56	0.9	0.50	0.74	0.3	0.22	0.73	11.6	6.0	
Ex. MH 3	Ex. MH 4	41.39	0.9	37.25	67.66	0.3	20.30	57.55	11.6	6.0	345.29
	Site Area 3	0.67	0.9	0.60	0.18	0.3	0.05	0.66	11.6	6.0	
Ex. MH 4	Ex. culvert	42.06	0.9	37.85	67.84	0.3	20.35	58.21	11.6	6.0	349.24
Proposed Culvert - 48" / 36" CLDI Blended Option											
Ex. MH	DS-1	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
DS-1	ACC PT 1	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
ACC PT 1	ACC PT 2	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
ACC PT 2	ACC PT 3	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
ACC PT 3	DS-2	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47
DS-2	Ex. culvert	40.36	0.9	36.32	65.85	0.3	19.76	56.08	11.6	6.0	336.47

APPENDIX 6:

Sketches



KEYPLAN		
REVISIONS NO.	DATE	REMARKS

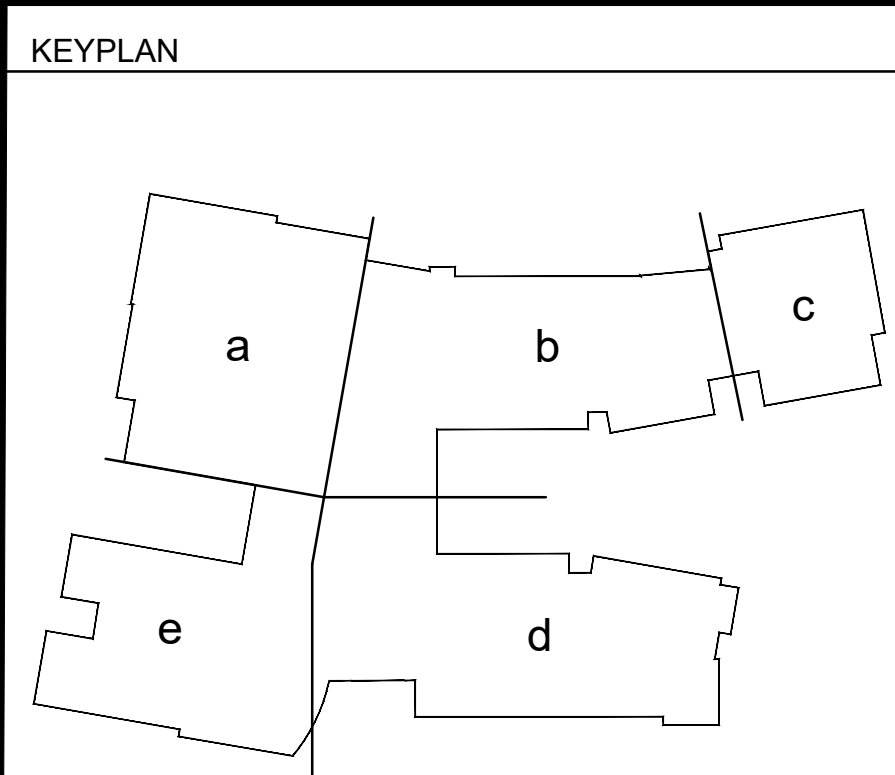
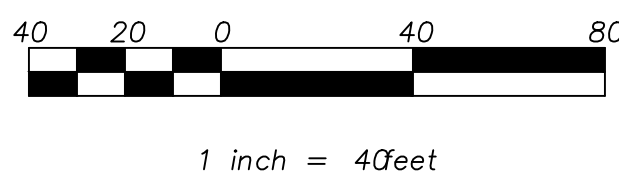
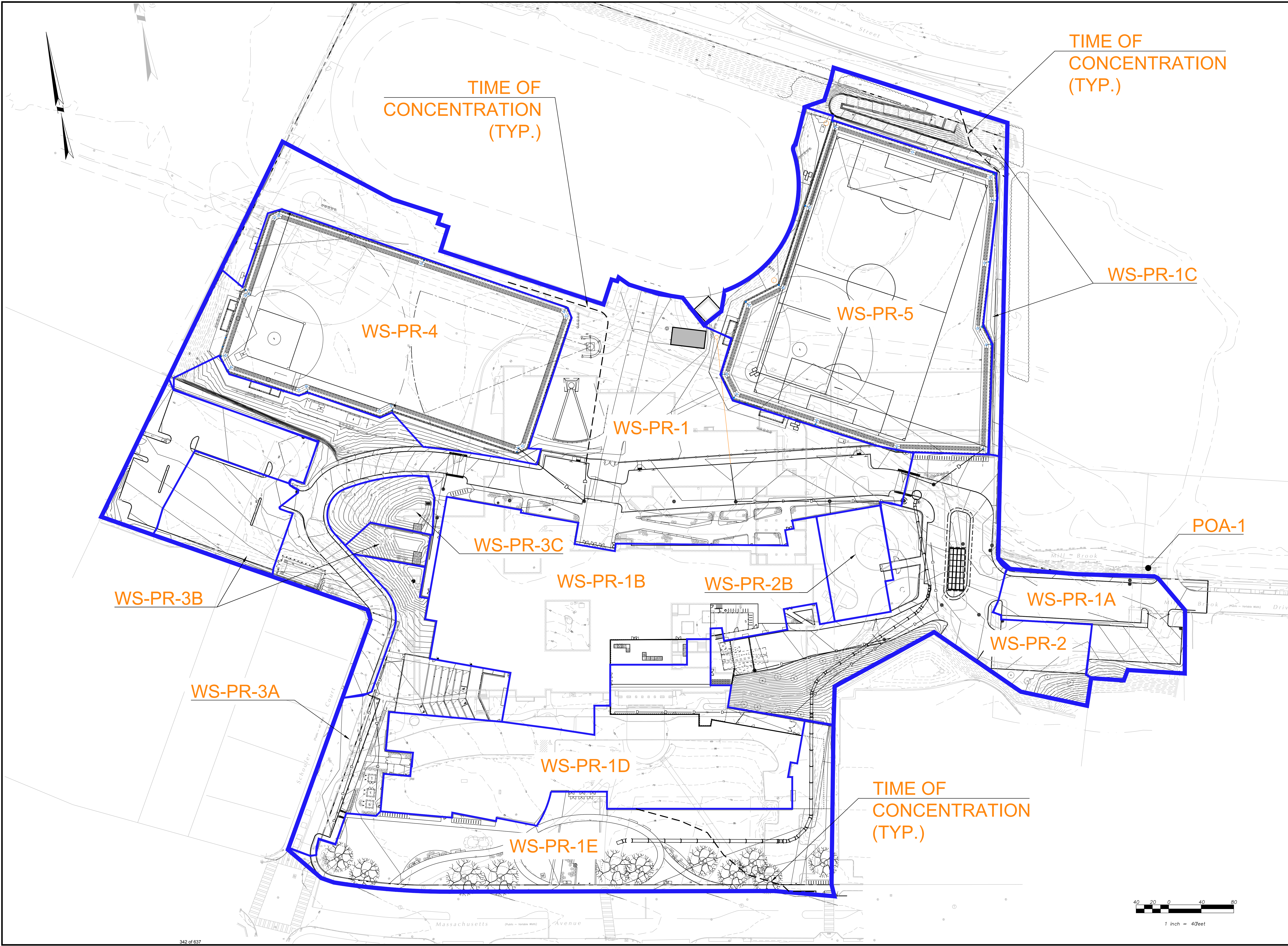
Avington High School
 Massachusetts Avenue, Avington, Massachusetts
EXISTING CONDITIONS
HYDROLOGY MAP
 SCALE: 1"=40'
 DRAWN BY: SM
 CHECKED BY: SG
 DRAWING NUMBER:
EX-HYD
 JOB NUMBER: 17211

60% CONSTRUCTION DOCUMENTS
 PROGRESS SET 05-04-2020

Samiotes Consultants Inc.
 Civil Engineers - Land Surveyors
 20A Street, Woburn, MA 02171
 P: 781.938.7739
 www.samiotes.com

samiotes

HMF ARCHITECTS
 100 Bishop Allen Drive
 Cambridge, MA 02142
 877.489.2200
 @HMFarch hmfh.com



REVISIONS NO.	DATE	REMARKS

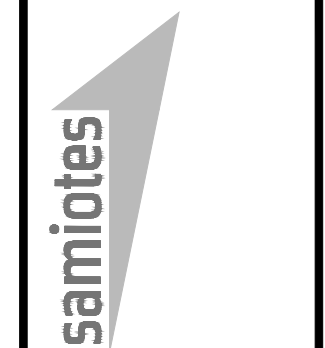
Arlington High School
Massachusetts Avenue, Arlington, Massachusetts
PROPOSED CONDITIONS
HYDROLOGY MAP
SCALE

DRAWING NUMBER
P-HYD
JCB
NUMBER
17211

CHECKED BY: SM
DRAWN BY: SM
SCALE

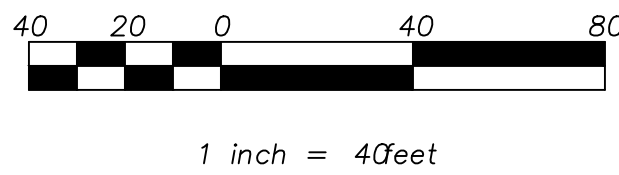
60% CONSTRUCTION DOCUMENTS
PROGRESS SET 05-04-2020

Samioles Consultants Inc.
100 Brookline Avenue
20th Street
Framingham, MA 01701
T 508.877.6688 F 508.877.6849
www.samioles.com



HM
FH
HM FH ARCHITECTS
100 Bishop Allen Drive
Cambridge, MA 02139
877.682.2200
info@hmfh.com

HM
FH



KEYPLAN		
REVISIONS NO	DATE	REMARKS

Arlington High School
Massachusetts Avenue, Arlington, Massachusetts

BMP LOCATION MAP

SCALE

BY:
JCB

NUMBER 17211

DRAWN BY: SM

CHECKED BY: SG

60% CONSTRUCTION DOCUMENTS
PROGRESS SET 05-04-2020

samiotes

Samioetes Consultants Inc.
100 Main Street
Framingham, MA 01701
T 508.877.6688
F 508.877.6688
www.samioetes.com

HM FH

HM FH ARCHITECTS
100 Bishop Allen Drive
Cambridge, MA 02139
877.682.2200
info@hmfh.com



Town of Arlington, Massachusetts

Deliberation: Notice of Intent: 1297 Massachusetts Ave

Summary:

MassDEP File #091-0321

This Notice of Intent (NOI) was presented to the Conservation Commission at its 04/16/2020 and 05/07/2020 meetings. It is strongly encouraged that members of the public submit written comment for this NOI to the Conservation Agent in advance of the hearing, by emailing Emily Sullivan at esullivan@town.arlington.ma.us. All materials submitted for this NOI can be found on the Commission's agenda and minutes page, under the agenda for the 05/21/2020 meeting.

Hearing Summary:

This project proposes the excavation and remediation of soil contaminated by commercial kitchen soy bean oil grease within the 100-ft Wetlands Buffer.

ATTACHMENTS:

Type	File Name	Description
▣ Notice of Intent	1297_Mass_Ave_NOI_Packet_Redacted.pdf	1297 Mass Ave NOI Packet
▣ Notice of Intent	1297_Mass_Ave_Supplemental_Materials.pdf	1297 Mass Ave Supplemental Materials
▣ Order of Conditions	05162020_Draft__1297_Mass_Ave_Findings_and_Special_Conditions.pdf	Draft 1297 Mass Ave OOC
▣ Notice of Intent	1297_Mass_Ave_04292020_Supplemental_Materials.pdf	1297 Mass Ave Supplemental Materials 04292020
▣ Notice of Intent	1297_Mass_Ave_5122020_Supplement_Materials.pdf	1297 Mass Ave Supplemental Materials 05122020

TRANSMITTAL

March 4, 2020

Emily Sullivan
Environmental Planner & Conservation Agent
Town of Arlington Conservation Commission
730 Massachusetts Avenue, Annex
Arlington, Massachusetts 02476

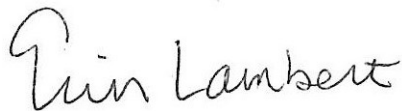
**RE: Wetlands Protection Agency Notice of Intent
D'Agostino's Delicatessen
1297 Massachusetts Avenue, Arlington, MA**

Item No.	Quantity	Description
1	7	WPA Form 3
2	7	Bylaw Filing Fees and Transmittal Form
3	7	Bylaw Filing and State Filing Fees Check
4	7	Abutters List and Abutter Notification Letter Copy
5	7	Affidavit of Service and Copies of Certified Mail Receipts
6	7	Legal Notice of Charge
7	7	Project Narrative
8	7	Site Plans (24x36)
9	7	USGS Site Location Map
10	7	FEMA Site Floodplain Map
11	7	Site Photo Log
12	1	Electronic Copy of Packet Submission

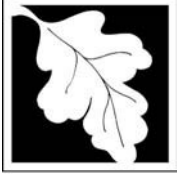
If you have any questions, or require additional information, please contact me at (603) 731-9883.

Very truly yours,

WILCOX & BARTON, INC.



Erin R. Lambert, P.E., LEED AP
Associate Vice President



Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username: **RRUCKER**

Transaction ID: **1179566**

Document: **WPA Form 3 - NOI**

Size of File: **249.37K**

Status of Transaction: **In Process**

Date and Time Created: **3/3/2020:4:14:44 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.

Massachusetts Department of Environmental
Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1179566
City/Town:ARLINGTON

A.General Information

1. Project Location:

a. Street Address	1297 MASSACHUSETTS AVENUE		
b. City/Town	ARLINGTON	c. Zip Code	02476
d. Latitude	42.42458N	e. Longitude	71.18177W
f. Map/Plat #	59	g.Parcel/Lot #	10.D

2. Applicant:

☐ Individual ☒ Organization

a. First Name		b. Last Name	
c. Organization	P&D REALTY		
d. Mailing Address	109 REFLECTION DRIVE		
e. City/Town	SANDWICH	f. State	MA
g. Zip Code	02563		
h. Phone Number		i. Fax	
j. Email			

3. Property Owner:

☐ more than one owner

a. First Name		b. Last Name	
c. Organization	P&D REALTY		
d. Mailing Address	109 REFLECTION DRIVE		
e. City/Town	SANDWICH	f. State	MA
g. Zip Code	02563		
h. Phone Number		i. Fax	
j. Email			

4. Representative:

a. First Name	RUSSELL	b. Last Name	BARTON
c. Organization	WILCOX & BARTON, INC.		
d. Mailing Address	#1B COMMONS DRIVE, UNIT 12B		
e. City/Town	LONDONDERRY	f. State	NH
g. Zip Code	03053		
h. Phone Number	603-369-4190	i. Fax	
j. Email	rbarton@wilcoxandbarton.com		

5. Total WPA Fee Paid (Automatically inserted from NOI Wetland Fee Transmittal Form):

a. Total Fee Paid	110.00	b. State Fee Paid	42.50	c. City/Town Fee Paid	67.50
-------------------	--------	-------------------	-------	-----------------------	-------

6. General Project Description:

THE PROPOSED PROJECT INVOLVES THE EXCAVATION AND REMEDIATION OF CONTAMINATED SOIL FROM A COMMERCIAL KITCHEN GREASE STORAGE CONTAINER SPILL.

7a. Project Type:

- | | |
|---|--|
| 1. <input type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Limited Project Driveway Crossing | 4. <input checked="" type="checkbox"/> Commercial/Industrial |
| 5. <input type="checkbox"/> Dock/Pier | 6. <input type="checkbox"/> Utilities |
| 7. <input type="checkbox"/> Coastal Engineering Structure | 8. <input type="checkbox"/> Agriculture (eg., cranberries, forestry) |
| 9. <input type="checkbox"/> Transportation | 10. <input type="checkbox"/> Other |

7b. Is any portion of the proposed activity eligible to be treated as a limited project subject to 310 CMR 10.24 (coastal) or 310

Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

WPA Form 3 - Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File #:

eDEP Transaction #:1179566

City/Town:ARLINGTON

CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project:

2. Limited Project

8. Property recorded at the Registry of Deeds for:

a. County:

b. Certificate:

c. Book:

d. Page:

SOUTHERN MIDDLESEX

21176

327

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. Buffer Zone & Resource Area Impacts (temporary & permanent):

☐ This is a Buffer Zone only project - Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.

2. Inland Resource Areas: (See 310 CMR 10.54 - 10.58, if not applicable, go to Section B.3. Coastal Resource Areas)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
---------------	-----------------------------	-------------------------------

a. ☐ Bank

1. linear feet

2. linear feet

b. ☐ Bordering Vegetated Wetland

1. square feet

2. square feet

c. ☐ Land under Waterbodies and Waterways

1. Square feet

2. square feet

3. cubic yards dredged

d. ☐ Bordering Land Subject to Flooding

1. square feet

2. square feet

3. cubic feet of flood storage lost

4. cubic feet replaced

e. ☐ Isolated Land Subject to Flooding

1. square feet

2. cubic feet of flood storage lost

3. cubic feet replaced

f. ☒ Riverfront Area

Mill Brook

1. Name of Waterway (if any)

2. Width of Riverfront Area (check one)

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project

53736

square feet

4. Proposed Alteration of the Riverfront Area:

2700

2700

0

a. total square feet

b. square feet within 100 ft.

c. square feet between 100 ft. and 200 ft.

Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

WPA Form 3 - Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File #:

eDEP Transaction #:1179566

City/Town:ARLINGTON

5. Has an alternatives analysis been done and is it attached to this NOI?

☐ Yes ☒ No

6. Was the lot where the activity is proposed created prior to August 1, 1996?

☒ Yes ☐ No

3.Coastal Resource Areas: (See 310 CMR 10.25 - 10.35)

Resource Area Size of Proposed Alteration Proposed Replacement (if any)

a. ☐ Designated Port Areas

Indicate size under

Land under the ocean below,

b. ☐ Land Under the Ocean

1. square feet

2. cubic yards dredged

c. ☐ Barrier Beaches

Indicate size under Coastal Beaches and/or Coastal Dunes, below

d. ☐ Coastal Beaches

1. square feet

2. cubic yards beach nourishment

e. ☐ Coastal Dunes

1. square feet

2. cubic yards dune nourishment

f. ☐ Coastal Banks

1. linear feet

g. ☐ Rocky Intertidal Shores

1. square feet

h. ☐ Salt Marshes

1. square feet

2. sq ft restoration, rehab, crea.

i. ☐ Land Under Salt Ponds

1. square feet

2. cubic yards dredged

j. ☐ Land Containing Shellfish

1. square feet

k. ☐ Fish Runs

Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above

1. cubic yards dredged

l. ☐ Land Subject to Coastal Storm Flowage

1. square feet

4.Restoration/Enhancement

☐ Restoration/Replacement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please entered the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5.Projects Involves Stream Crossings

☐ Project Involves Streams Crossings

□ **Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1179566
City/Town:ARLINGTON

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings

b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage of Endangered Species program (NHESP)?

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:
Natural Heritage and Endangered Species
Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

b. Date of map:AUGUST 1, 2017

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18)....

c. Submit Supplemental Information for Endangered Species Review * (Check boxes as they apply)

1. ☐ Percentage/acreage of property to be altered:

(a) within Wetland Resource Area

percentage/acreage

(b) outside Resource Area

percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

3. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetland jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

a. ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

b. ☐ Photographs representative of the site

c. ☐ MESA filing fee (fee information available at: <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html>)

Make check payable to "Natural Heritage & Endangered Species Fund" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

d. ☐ Vegetation cover type map of site

e. ☐ Project plans showing Priority & Estimated Habitat boundaries

d. OR Check One of the following

1. ☐ Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, <http://www.mass.gov/eea/agencies/dfg/dfw/laws-regulations/cmr/321-cmr-1000-massachusetts-endangered-species-act.html#10.14>; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing.

a. NHESP Tracking Number

b. Date submitted to NHESP

□ **Massachusetts Department of Environmental Protection**

Bureau of Resource Protection - Wetlands

WPA Form 3 - Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1179566
City/Town:ARLINGTON

3. ☐ Separate MESA review completed.

Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review...

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?

a. ☒ Not applicable - project is in inland resource area only

b. ☐ Yes ☐ No

If yes, include proof of mailing or hand delivery of NOI to either:

South Shore - Cohasset to Rhode Island, and the Cape & Islands:

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 S. Rodney French Blvd
New Bedford, MA 02744

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930

If yes, it may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office.

For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional office.

3. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

a. ☐ Yes ☒ No

If yes, provide name of ACEC (see instructions to WPA Form 3 or DEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC Name

4. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

a. ☐ Yes ☒ No

5. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L.c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L.c. 130, § 105)?

a. ☐ Yes ☒ No

6. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

a. ☒ Yes, Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

1. Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol.2, Chapter 3)

2. ☐ A portion of the site constitutes redevelopment

3. ☐ Proprietary BMPs are included in the Stormwater Management System

b. ☐ No, Explain why the project is exempt:

1. ☐ Single Family Home

☐ **Massachusetts Department of Environmental Protection**

Bureau of Resource Protection - Wetlands

WPA Form 3 - Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1179566
City/Town:ARLINGTON

☐ 2. Emergency Road Repair

☐ 3. Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department by regular mail delivery.

1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.) ☒
2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area. ☒
3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s). ☐ Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. List the titles and dates for all plans and other materials submitted with this NOI. ☒

a. Plan Title:	b. Plan Prepared By:	c. Plan Signed/Stamped By:	c. Revised Final Date:	e. Scale:
SITE PLAN	RUSSEL S. RUCKER	DAVID L. FROTHINGHAM	3/4/2020	1" = 20'
CONSTRUCTION & EROSION CONTROL DETAILS	RUSSEL S. RUCKER	DAVID L. FROTHINGHAM	3/4/2020	N.T.S.

5. If there is more than one property owner, please attach a list of these property owners not listed on this form. ☐
6. Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed. ☐
7. Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed. ☐
8. Attach NOI Wetland Fee Transmittal Form. ☒
9. Attach Stormwater Report, if needed. ☒

□ **Massachusetts Department of Environmental Protection**
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1179566
City/Town:ARLINGTON

E. Fees

1. Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payer name on check: First Name	7. Payer name on check: Last Name

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Sam D'Agostino	3/3/2020
1. Signature of Applicant	2. Date
Sam D'Agostino	3/3/2020
3. Signature of Property Owner(if different)	4. Date
Russell Barton	3/3/2020
5. Signature of Representative (if any)	6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in Section C, Items 1-3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Wetland Fee Transmittal
Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1179566
City/Town:ARLINGTON

A. Applicant Information

1. Applicant:

a. First Name		b. Last Name	
c. Organization	P&D REALTY		
d. Mailing Address	109 REFLECTION DRIVE		
e. City/Town	SANDWICH	f. State	MA
g. Zip Code	02563		
h. Phone Number		i. Fax	
j. Email			

2. Property Owner:(if different)

a. First Name		b. Last Name	
c. Organization	P&D REALTY		
d. Mailing Address	109 REFLECTION DRIVE		
e. City/Town	SANDWICH	f. State	MA
g. Zip Code	02563		
h. Phone Number		i. Fax	
j. Email			

3. Project Location:

a. Street Address	1297 MASSACHUSETTS AVENUE	b. City/Town	ARLINGTON
-------------------	---------------------------	--------------	-----------

Are you exempted from Fee? ☐ (YOU HAVE SELECTED 'NO')

Note: Fee will be exempted if you are one of the following:

- City/Town/County/District
- Municipal Housing Authority
- Indian Tribe Housing Authority
- MBTA

State agencies are only exempt if the fee is less than \$100

B. Fees

Activity Type	Activity Number	Activity Fee	RF Multiplier	Sub Total
A.) WORK ON SINGLE FAMILY LOT; ADDITION, POOL, ETC.;	1	110.00		110.00
		City/Town share of filling fee	State share of filing fee	Total Project Fee
		\$67.50	\$42.50	\$110.00

Bylaw Filing Fees and Transmittal Form

Rules:

1. Fees are payable at the time of filing the application and are non-refundable.
2. Fees shall be calculated per schedule below.
3. Town, County, State, and Federal Projects are exempt from fees.
4. These fees are in addition to the fees paid under M.G.L. Ch. 131, s.40 (ACT).

Fee Schedule (ACC approved 1/8/15):

\$	No./Area	Category
		(R1) RDA - \$150 local fee, no state fee
\$200	1	(N1) Minor Project - \$200 (house addition, tennis court, swimming pool, utility work, work in/on/or affecting any body of water, wetland or floodplain).
		(N2) Single Family Dwelling - \$600
		(N3) Multiple Dwelling Structures - \$600 + \$100 per unit all or part of which lies within 100 feet of wetlands or within land subject to flooding.
		(N4) Commercial, Industrial, and Institutional Projects - \$800 + 50¢/s.f. wetland disturbed; 2¢/s.f. land subject to flooding or buffer zone disturbed.
		(N5) Subdivisions - \$600 + \$4/l.f. feet of roadway sideline within 100 ft. of wetlands or within land subject to flooding.
		(N6) Other Fees - copies, printouts; per public records law
		(N7) Minor Project Change - \$50
		(N8) Work on Docks, Piers, Revetments, Dikes, etc - \$4 per linear foot
		(N9) Resource Boundary Delineation (ANRAD) - \$1 per linear foot
		(N10) Certificate of Compliance (COC or PCOC) - No charge if before expiration of Order, \$200 if after that date.
		(N11) Amendments - \$300 or 50% of original local filing fee, whichever is less.
		(N12) Extensions -
		a. Single family dwelling or minor project - \$100.
		b. Other - \$150.
		(N13) Consultant Fee -per estimate from consultant
\$200	TOTAL	

Note: Submit this form along with the forms submitted for the ACT - the "Wetlands Filing Fee Calculations Worksheet," and the "Notice of Intent Fee Transmittal Form."

Bank of America

ERIN R LAMBERT

3/4/2020

54-49/114 NH
1675

Date

Pay Town of Arlington \$ 267.50
to the order of Two-hundred sixty-seven and 50/100 Dollars

Richard Curren

Bank of America

ACH R/T 011400495

Memo NDI Fees

Erin R. Lambert

Photo
Safe
Deposit®
Details on back

NOI for Site Remediation
1297 Massachusetts Avenue, Arlington, MA 02476

Map	Block	Lot	Property Owner	Mailing Address	Quantity
Owner/Applicant:					
59	1	10.D	P&D Realty	109 Reflection Drive Sandwich, MA 02563	1
Abutters:					
59	1	11	1309-1323 Mass Ave, LLC.	12 Pepper Hill Drive Winchester, MA 01890	2
59	1	12	30 Park Ave Associates, LLP.	PO Box 288 Arlington, MA 02476	3
59	1	7	Lacourt Enterprises, LLC.	30 College Avenue Somerville, MA 02144	4
59.A	1	1.1	Xiaohe Ma	1283 Massachusetts Avenue, Unit 1 Arlington, MA 02476	5
59.A	1	1.2	Gregory R. Josephs & Brian D. Stricker	1283-1285 Mass. Avenue, Unit 2 Arlington, MA 02476	6
59.A	1	1.3	Radhika Sriram	1283-1285 Mass. Avenue, Unit 3 Arlington, MA 02476	7
59	1	9	Sean Galvin Trustee	630 High Street Medford, MA 02115	8
59	1	19	30 Park Ave Associates, LLP.	PO Box 288 Arlington, MA 02476	Duplicate
170	2	1	Nigoghos & Carolyn Atinizian	545 Concord Avenue, Suite 400 Cambridge, MA 02138	9
170	2	2	Nicolas Perhandis Trustee	163 Hillside Avenue Arlington, MA 02476	10
170	2	3	Cambridge Savings Bank	1374 Massachusetts Avenue Cambridge, MA 02138	11
170	2	4	Cambridge Savings Bank	1374 Massachusetts Avenue Cambridge, MA 02138	Duplicate
170	3	5	John R. & Mark Wanamaker Trust	1298 Massachusetts Avenue Arlington, MA 02476	12
170	3	6	John R. Wanamaker	41 Dyer Street North Billerica, MA 01862	13
170	3	7	Eleanor Leclain & John Kevin Clark	1292-1294 Massachusetts Avenue Arlington, MA 02476	14
165.A	3	1288	Melissa Dolan	1288 Massachusetts Avenue, Unit 1 Arlington, MA 02476	15
165.A	3	1290	Jesse D. & Regina M. O'Brien	1290 Massachusetts Avenue, Unit 2 Arlington, MA 02476	16

Abutters List Verified: 03/04/2020

Abutter Notification

Notification to Abutters Under the Massachusetts Wetlands Protection Act And Arlington Wetlands Protection Bylaw

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the Arlington Wetlands Protection Bylaw, you are hereby notified of the following:

The Conservation Commission will hold a public hearing in the second floor conference room of the Town Hall Annex, 730 Massachusetts Avenue, Arlington, on March 19, 2020, at 7:30 PM in accordance with the provisions of the Mass. Wetlands Protection Act (M.G.L. Ch. 131, s. 40, as amended) and the Town of Arlington Bylaws Article 8, Bylaw for Wetland Protection, for a Notice of Intent from P&D Realty, for remediation of contaminated soils from a commercial kitchen, grease storage container spill at 1297 Massachusetts Avenue, within 200 feet of a Riverfront area, on Assessor's Property Map #59, Lot #10D.

A copy of the application and accompanying plans are available for inspection Mon. - Thurs. 8am-4pm and Fri. 8am-noon at the Conservation Commission office, first floor of the Town Hall Annex, 730 Massachusetts Avenue, Arlington, MA 02476. For more information call the applicant at 781-756-8071, the project engineer manager at 603-369-4190 x502, or the Arlington Conservation Commission at 781-316-3012, or the DEP Northeast Regional Office at 978-694-3200.

NOTE: Notice of the Public Hearing will be published at least five (5) business days in advance in *The Arlington Advocate* and will also be posted at least 48 hours in advance in the Arlington Town Hall.

The meeting information for your hearing is:

Date: Thursday, March 19, 2020

Time: 7:30 PM

Affidavit of Service

(Please return to Conservation Commission)

I, Russel Rucker, being duly sworn, do hereby state as follows: on March 4, 2020, I mailed a "Notification to Abutters" in compliance with the second paragraph of Massachusetts General Laws, Chapter 131, s.40, the DEP Guide to Abutter Notification dated April 8, 1994, and the Arlington Wetlands Protection Bylaw, Title V, Article 8 of the Town of Arlington Bylaws in connection with the following matter:

Remediation of contaminated soils from a commercial kitchen, grease storage container spill at 1297 Massachusetts Avenue, Arlington, MA.

The form of the notification, and a list of the abutters to whom it was provided and their addresses, are attached to this Affidavit of Service.

Signed under the pains and penalties of perjury, this 4th day of March 2020.



Name

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City, State, ZIP+4®

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JESSE D. & REGINA M. O'BRIEN

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1290 MASSACHUSETTS AVE., UNIT 2

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Postage \$0.55

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P&D REALTY

Street and Apt. No., or PO Box No.

109 REFLECTION DRIVE

City, State, ZIP+4®

SANDWICH, MA 02563

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\$

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MELISSA DOWD

Street and Apt. No., or PO Box No.

1288 MASSACHUSETTS AVE., UNIT 1

City, State, ZIP+4®

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Postage \$0.55

Total Postage and Fees \$4.10

\$

Sent To

1309-1323 MASS AVE, LLC.

Street and Apt. No., or PO Box No.

12 PEPPER HILL DR.

City, State, ZIP+4®

WINCHESTER, MA 01890

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30 PARK AVE ASSOCIATES, LLP.

Street and Apt. No., or PO Box No.

PO BOX 288

City, State, ZIP+4®

ARLINGTON, MA 02476

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Postage \$0.55

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LACOURT ENTERPRISES, LLC

Street and Apt. No., or PO Box No.

30 COLLEGE AVE.

City, State, ZIP+4®

SOMERVILLE, MA 02144

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☐ Adult Signature Required \$0.00

☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.55

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City, State, ZIP+4®

ARLINGTON, MA 02476

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Extra Services & Fees (check box, add fee as appropriate)

☐ Return Receipt (hardcopy) \$0.00

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☐ Certified Mail Restricted Delivery \$0.00

☐ Adult Signature Required \$0.00

☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.55

Total Postage and Fees \$4.10

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03/04/2020

Sent To
GREGORY JOSEPHS & BRIAN STRICKER

Street and Apt. No., or PO Box No.

1283-1285 MASSACHUSETTS AVE., UNIT 2

City, State, ZIP+4®

ARLINGTON, MA 02476

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Extra Services & Fees (check box, add fee as appropriate)

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☐ Adult Signature Required \$0.00

☐ Adult Signature Restricted Delivery \$0.00

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Total Postage and Fees \$4.10

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Sent To
RADHIKA SRIRAM

Street and Apt. No., or PO Box No.

1283-1285 MASSACHUSETTS AVE., UNIT 3

City, State, ZIP+4®

ARLINGTON, MA 02476

PS Form 3800, April 2015 PSN 7530-02-000-9047

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Extra Services & Fees (check box, add fee as appropriate)

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☐ Adult Signature Required \$0.00

☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.55

Total Postage and Fees \$4.10

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Sent To
SEAN GALVIN TRUSTEE

Street and Apt. No., or PO Box No.

630 HUGH ST.

City, State, ZIP+4®

MEDFORD, MA 02155

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

7019 1120 0001 2181 8611

U.S. Postal Service™ CERTIFIED MAIL® RECEIPT

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CAMBRIDGE, MA 02138

Certified Mail Fee \$3.55

Extra Services & Fees (check box, add fee as appropriate)

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☐ Certified Mail Restricted Delivery \$0.00

☐ Adult Signature Required \$0.00

☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.55

Total Postage and Fees \$4.10

0301
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03/04/2020

Sent To
NINA KHOS & CAROLIN ATINEZIAN

Street and Apt. No., or PO Box No.

545 CONCORD AVE., SUITE 400

City, State, ZIP+4®

CAMBRIDGE, MA 02138

PS Form 3800, April 2015 PSN 7530-02-000-9047

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361 of 637

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Extra Services & Fees (check box, add fee as appropriate)

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Postage \$0.55

Total Postage and Fees \$4.10

\$

Sent To

NICOLAS PERHANDIS TRUSTEE

Street and Apt. No., or PO Box No.

163 HILLSIDE AVE.

City, State, ZIP+4®

ARLINGTON, MA 02476

PS Form 3800, April 2015 PSN 7530-02-000-9047

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03/04/2020

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CAMBRIDGE, MA 02138

Certified Mail Fee \$3.55

\$0.00

Extra Services & Fees (check box, add fee as appropriate)

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03/04/2020

Legal Notice Charge Authorization

DATE: March 4, 2020

TO: legals@wickedlocal.com

I hereby authorize Community Newspapers to bill me directly for the legal notice to be published in the Arlington Advocate newspaper on March 11, 2020 for a public hearing with the Arlington Conservation Commission to review a project at the following location:
1297 Massachusetts Avenue, Arlington, MA

Thank you.

Signed: 

Send bill to:

Wilcox & Barton, Inc. (Address)
PO Box 1630
Derry, NH 03038
603-369-4190 x527 (Phone)

Project Narrative

Project: D'Agostino's Delicatessen Grease Remediation
Address: 1297 Massachusetts Avenue, Arlington, Massachusetts
Owner/Applicant: P&D Realty

The project involves the remediation of contaminated soil from a kitchen grease storage container spill at D'Agostino's Delicatessen. Grease in the storage container has spilled into the area at the top of the bank behind the grease container with some surface runoff on the bank. No spilled grease has impacted Mill Brook at the bottom of the bank, which runs through the project property. Construction activities include the removal and replacement of soil, planting two new trees to replace an existing tree that will be by the excavation, installation of two new traffic bollards behind the grease container, and restoration of areas disturbed during construction activities. An estimated 21 cubic yards of grease-contaminated soil is expected to be removed and replaced with 26 cubic yards of clean, compacted fill. Most of the excavation will take place within the vicinity of the grease container storage area and within the top of the bank behind the grease container. Some surface excavation is expected on the bank to remove grease from the topsoil. A summary of the expected excavation depths at the specified locations is tabulated below.

Excavation & Backfill Calculations

Excavation Volume			
Location	Area (sf)	Depth (ft)	Volume (cf)
Grease container	168	2.0	336
Top of bank	156	1.0	156
Bank	144	0.5	72
Total			564

Fill Volume

Fill Vol. = Excav. Vol. x Compaction Factor
Fill Vol. = 564 cf x 1.25
Fill Vol. = 705 cf
Fill Vol. = 26 cy

In order to complete removal of contaminated soil, an existing 12-inch diameter at breast height (DBH) deciduous tree near the top of the bank behind the grease container shall be removed prior to start of excavation. The base of the tree is in the expected excavation area, and a majority of its base roots are expected to be impacted by excavation activity. There shall be 2 new trees planted at the top of the bank during site restoration activities to replace the removed tree. Impacts to other trees on the bank are not expected given the shallow depth of exaction on the bank. However, the contractor shall notify the engineer immediately should excavation activities require the removal of additional tree roots. New trees planted to replace the removed tree shall be Red Maple (*Acer Rebrum*) of 2.5-inch to 3.5-inch caliper.

Stormwater Management and Erosion Control

The project property is 1.23-acres (53,736-square feet). Most of the ground cover on the property consists of impervious surfaces for two buildings with associated parking lots and driveways, resulting in a total 33,000-square feet of impervious cover (61% of total site area). A catch basin east of the project area captures most of the surface runoff on the property. The rest of the surface runoff is conveyed to Mill Brook, which runs through the northern section of the property. All of the property is within the 200-foot riverfront area, and approximately 36,500-square feet is within 100-feet of Mill Brook. The project area is limited to a 2,700-square foot area along the upper bank and is entirely within 100-feet of Mill Brook.

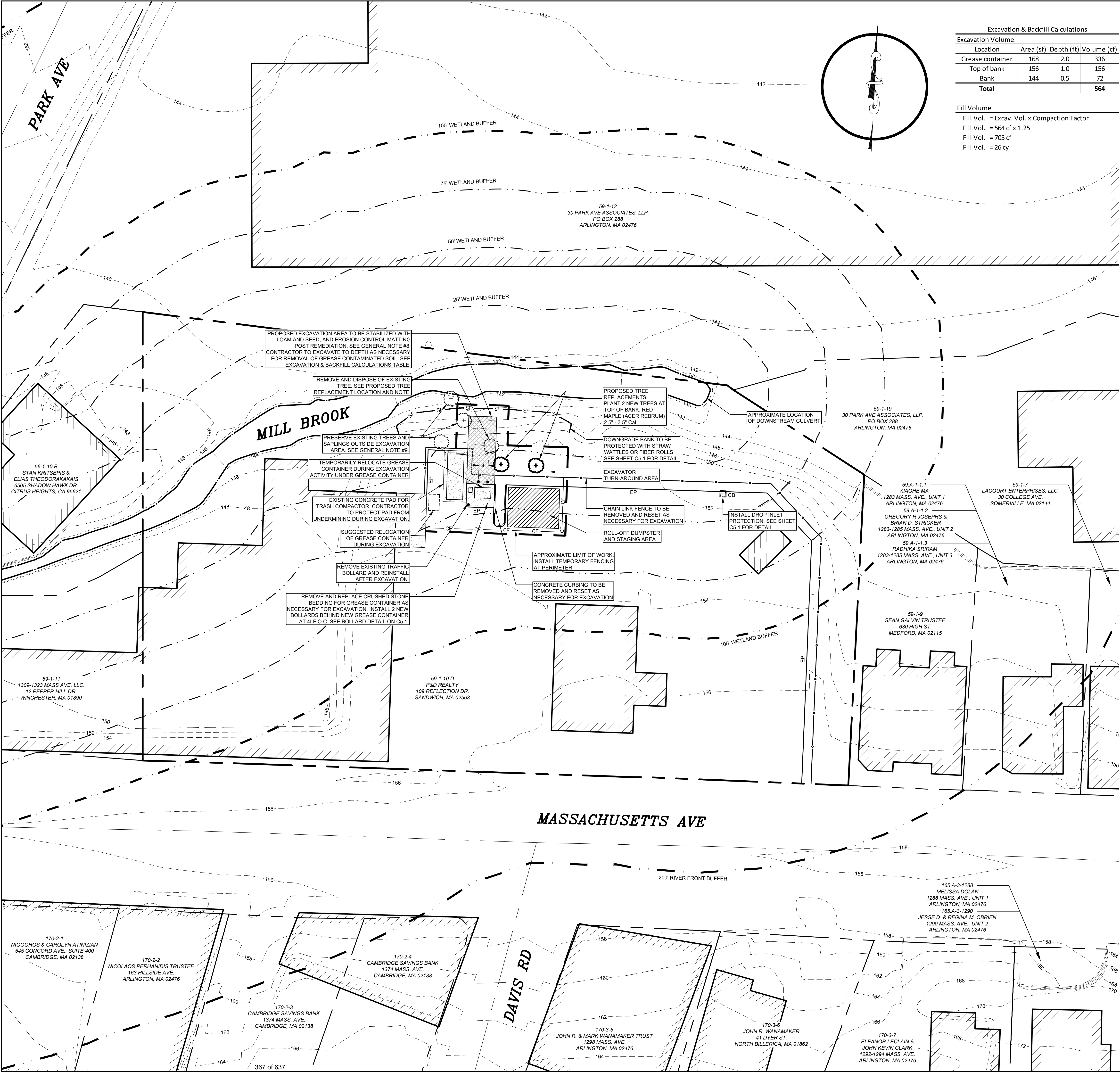
Most of the stormwater improvements post-construction shall be qualitative. No additional impervious area is proposed for the project, and all disturbed areas will be stabilized to a state equal to or better than their condition prior to construction. The existing bank in the project area is loose and uneven with some vegetative cover and slopes of 2:1 and greater. The contractor shall stabilize the bank with compacted fill at a slope of 2:1 or less where permitted, install erosion control matting, and reseed the disturbed areas. To replace the removal of the existing tree in the excavation zone of the project area, 2 new trees shall be planted at the top of the bank within the project area. Adding new trees and enhancing the vegetative cover on the slope further helps to protect Mill Brook from surface pollutants. Stormwater runoff from the project area will be at or below the current runoff rates due to the enhance vegetative cover.

Prior to any earth disturbance, temporary fencing, perimeter barriers, and inlet protections will be installed around the project area. Temporary fencing will be installed at the limits of disturbance for each phase of construction to prevent the expansion of disturbed areas beyond the limits of the phase. Fencing will be inspected weekly and replaced or repaired if damaged. For erosion control, fiber rolls will be placed down gradient of all disturbed areas. The fiber rolls will have a diameter of 9-inches or 12-inches and will be installed with 2-inch x 2-inch x 36-inch wooden stakes placed 10-feet on center. Existing and proposed storm drain inlets will also be protected from the discharge of sediment laden runoff by implementation of fiber rolls. See sheet C5.1 of attached Construction & Erosion Control Details for installation. The fiber rolls will be inspected weekly and after every rain fall event producing runoff. Fiber rolls that are dislodged or damaged will be replaced. Accumulated sediment will be removed when it reaches $\frac{1}{2}$ the exposed height of the fiber roll.

The contractor shall fill and compact excavated areas and restore all disturbed areas with loam and seed. All stockpiles will be encircled with silt fence or fiber rolls to prevent migration of sediment from the stockpile. Erosion control matting shall be installed on the bank to stabilize the slope. The erosion control matting will be inspected weekly and after every rain fall event producing runoff. All disturbed areas which have reached final grade will be seeded and mulched within 48 hours of completion. Seeded areas will be inspected weekly and within 24 hours of all rainfall events of 0.25-inches or greater. Any areas where runoff has displaced the topsoil, seed, or mulch will be repaired immediately. Restoration of the disturbed areas shall be considered stabilize after a minimum of 85% vegetated growth has been established. After the entire site has reached final stabilization, the remaining erosion control measures will be removed within 30 days.

Supporting evidence that the project has sufficient climate change resilience is as followed:

1. The project will not increase impervious area on the site and existing green spaces with sparse vegetation will be reseeded to increase the slope stability of the bank with more dense vegetation. New traffic bollards and planted trees shall help protect the bank as physical barriers.
2. New plantings and vegetation shall revitalize green spaces, decrease total surface runoff in the restored areas, and reduce the amount of common surface pollutants entering Mill Brook.
3. The existing tree to be removed will be replaced with 2 Red Maple trees (native, non-invasive), which are hardy trees, resilient to adverse growing conditions. Restoring disturbed areas with loam and seed also promotes long-lasting ground cover.
4. No new structures are proposed. The existing structures shall be unimpacted by proposed construction activities.



Excavation & Backfill Calculations			
Excavation Volume			
Location	Area (sf)	Depth (ft)	Volume (cf)
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Fill Vol. = 705 cf
Fill Vol. = 26 cy

LEGEND	
	PROPERTY LINE
	ABUTTER'S PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	BUILDINGS
	ROADWAY CENTERLINE
	EDGE OF PAVEMENT
	CURB
	CONCRETE PAD
	CHAIN LINK FENCE
	EDGE OF WETLAND/WATERWAY
	200' RIVERFRONT BUFFER
	100' WETLAND/WATERWAY BUFFER
	WETLAND/WATERWAY BUFFER
	TEMPORARY FENCE
	FIBER ROLLS
	LIMIT OF WORK
	CATCH BASINS
	INLET PROTECTION
	DECIDUOUS TREES

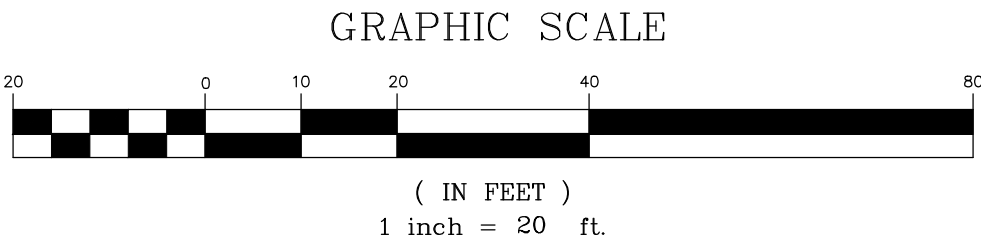
- GENERAL NOTES:
- EXISTING CONDITIONS, NORTH ORIENTATION, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON DATA COLLECTED AND PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES.
1.1. STRUCTURES LAYER UPDATED AUGUST 2019
1.2. TAX PARCELS LAYER UPDATED JANUARY 2020
1.3. ROAD CENTER LINES LAYER UPDATED NOVEMBER 2018

- TOPOGRAPHICAL INFORMATION PROVIDED BY THE TOWN OF ARLINGTON, MA GIS DATA "2-FOOT ELEVATION CONTOURS" DATED 2018.
- CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF WALLS AND/OR SHORING OF EXCAVATIONS DURING CONSTRUCTION.
- THE CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS AND SUBMITTALS BEFORE SUBMISSION TO THE ENGINEER. THUS, PROVIDING ANY INFORMATION REQUIRED OF THE FABRICATOR SUCH AS FIELD DIMENSIONS, ELEVATIONS, ETC. OTHERWISE THE SHOP DRAWINGS OR SUBMITTALS WILL BE REJECTED UNTIL SUCH INFORMATION IS FURNISHED BY THE CONTRACTOR.
- BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT, ASTM D1557.
- THE CONTRACTOR SHALL CONTACT DIG-SAFE (1-888-DIG-SAFE) AT LEAST 48 HOURS AND LESS THAN 30 DAYS PRIOR TO STARTING CONSTRUCTION AND SHALL VERIFY ALL UTILITY LOCATIONS IN THE FIELD.
- CONTRACTOR WILL NOTIFY ENGINEERS IMMEDIATELY IF SITE CONDITIONS DIFFER FROM WHAT IS SHOWN ON PLAN.
- CONTRACTOR TO USE NORTH AMERICAN GREEN BONNET SC150BN MATTING FOR ALL EROSION CONTROL MATTING. 70% STRAW / 30% COCONUT FIBER MATRIX.
- CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREE ROOTS. IF ADDITIONAL TREES NEED TO BE IMPACTED FOR REMEDIATION ACTIVITIES CONTACT ENGINEER IMMEDIATELY.

- LANDSCAPING NOTES:
- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH PLANTING OPERATIONS
 - LANDSCAPING CONTRACTOR SHALL RECEIVE SITE GRADE TO +/- 0.10 FOOT.
 - ALL PLANT MATERIALS AND FINAL LOCATION OF ALL PLANT MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION
 - IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR SHALL CONTACT OWNER'S REPRESENTATIVE FOR IMMEDIATE RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE OWNER'S REPRESENTATIVE WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE THE MATERIALS.
 - CONTRACTOR SHALL FURNISH PLANT MATERIALS FREE OF PESTS OR PLANT DISEASES. PRE-SELECTED OR "TAGGED" MATERIAL MUST BE INSPECTED BY THE CONTRACTOR AND CERTIFIED AS PEST AND DISEASE FREE. IT IS THE CONTRACTOR'S OBLIGATION TO WARRANTY ALL PLANT MATERIALS.
 - ALL GROUND COVERS SHALL BE TRIANGULARLY SPACED UNLESS OTHERWISE NOTED.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY EXISTING MATERIALS DAMAGED DURING PLANTING OPERATIONS.
 - ALL LANDSCAPE AREAS SHALL BE COVERED WITH 2-INCHES OF ORGANIC BARK MULCH UNLESS OTHERWISE NOTED.
 - AREAS SHOWN AS GROUND COVER AT THE BASE OF TREE AND SHRUB MATERIALS MUST CONFORM TO THE FOLLOWING CRITERIA. THERE SHALL BE NO GROUND COVER PLANT MATERIAL AT THE BASE OF THE TREE OR SHRUB AS FOLLOWS: A) 4-FOOT RADIUS AROUND EVERGREEN TREES, B) 3-FOOT RADIUS AROUND DECIDUOUS TREES; AND C) 2-FOOT RADIUS AROUND LARGE SHRUBS.
 - FINAL PLACEMENT OF ALL PLANT MATERIALS SHALL BE SUBJECT TO APPROVAL OF OWNER'S REPRESENTATIVE PRIOR TO FINAL PLACEMENT AND BACKFILL. CONTACT OWNER'S REPRESENTATIVE 24-HOURS PRIOR TO PLACEMENT FOR APPROVAL.
 - ALL DISTURBED AREAS, UNLESS OTHERWISE NOTED, TO BE LOAM, SEEDED, AND MULCHED.

EROSION CONTROL SEED		
SEED	BY % MASS	% GERMINATION (MIN)
WINTER RYE 80 (MIN)	80 (MIN)	85
RED FESCUE (CREEPING)	4 (MIN)	80
PERENNIAL GRASS	3 (MIN)	90
RED CLOVER	3 (MIN)	90
OTHER CROP GRASS	0.5 (MAX)	
NOXIOUS WEED SEED	0.5 (MAX)	
INERT MATTER	1.0 (MAX)	

PERMANENT SEED MIX		
SEED	BY % MASS	% GERMINATION (MIN)
RED FESCUE (CREEPING)	50	85
KENTUCKY BLUE	25	85
PERENNIAL RYE GRASS	10	90
RED TOP	10	85
LANDINO CLOVER	5	85



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CONCORD, NH 03301
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Owner

P&D REALTY

109 REFLECTION DR
SANDWICH, MA

Site

D'AGOSTINO'S
DELICATESSEN

1297 MASS. AVE.
ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Site Plan

Scale

1" = 20'

Date

03/04/2020

Drafted By

RSR

Checked By

DLF

Project Mgr

RWB

Project Number

PDR0001

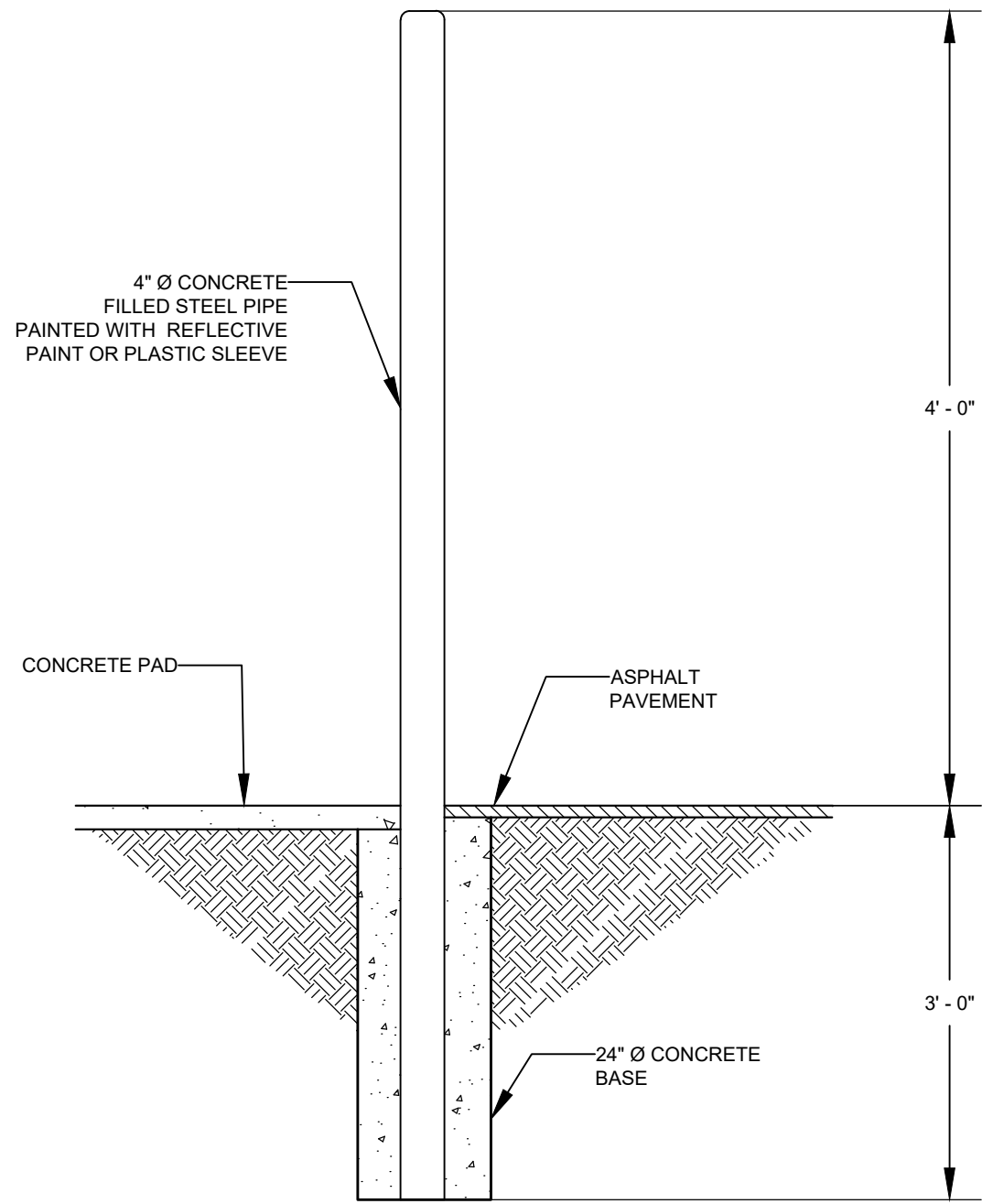
Sheet Number



ENGINEER: DAVID L. FROTHINGHAM III
MA P.E. #53592

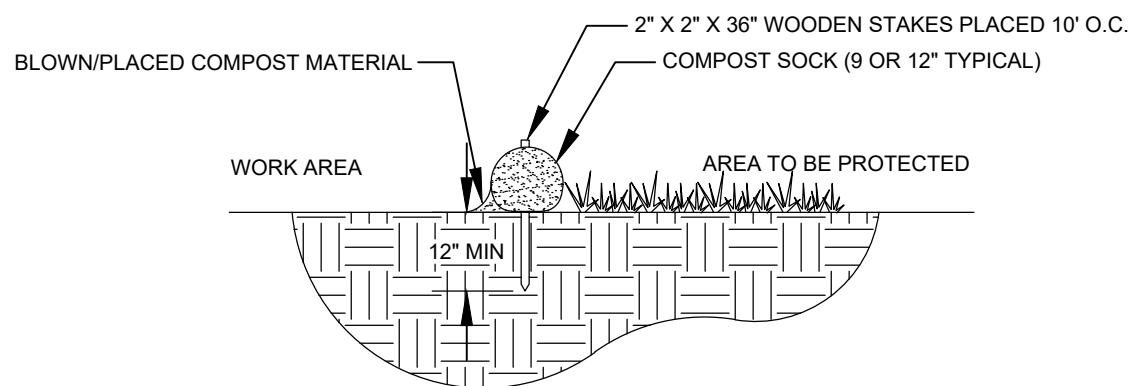
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1 of 2

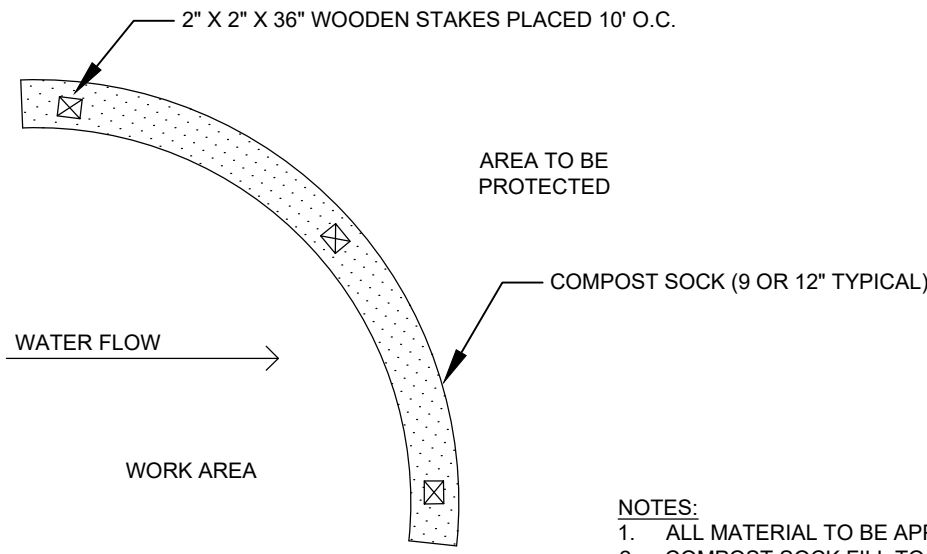


TRAFFIC BOLLARD

SOURCE: WILCOX & BARTON, INC.
NOT TO SCALE



SECTION

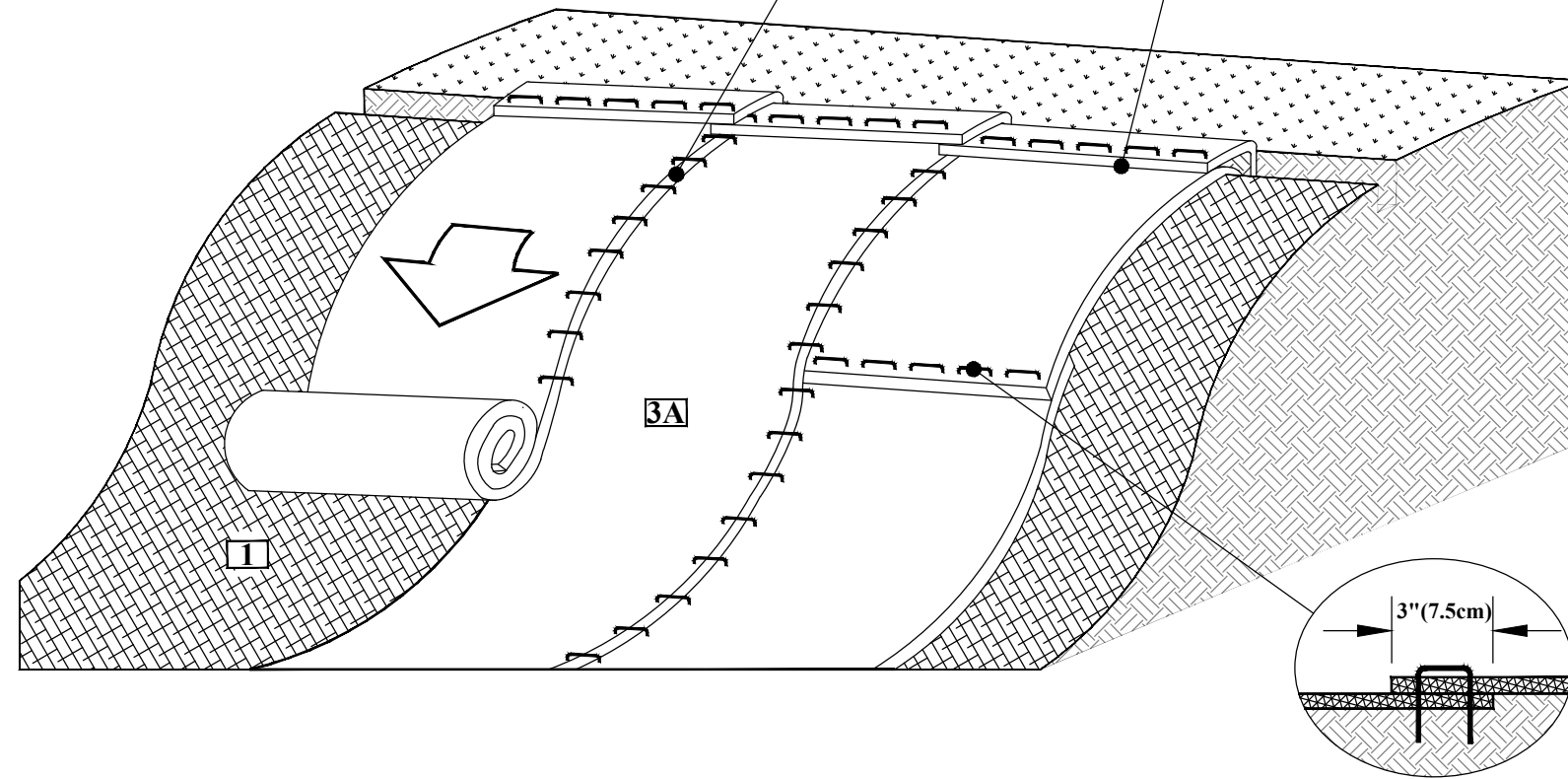
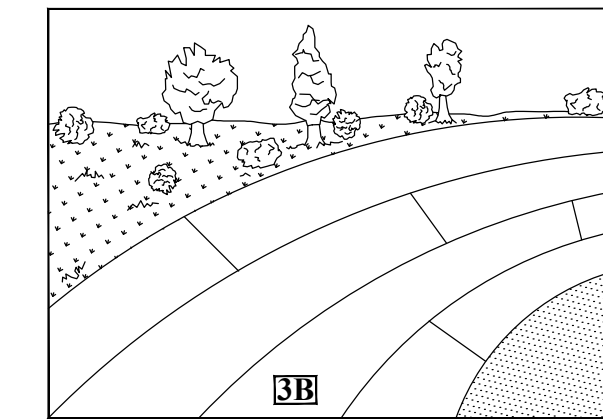


PLAN

- NOTES:
1. ALL MATERIAL TO BE APPROVED BY ENGINEER.
 2. COMPOST SOCK FILL TO BE APPROVED BY ENGINEER.
 3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST SOCK OR FIBER ROLL SEDIMENT CONTROL

NOT TO SCALE



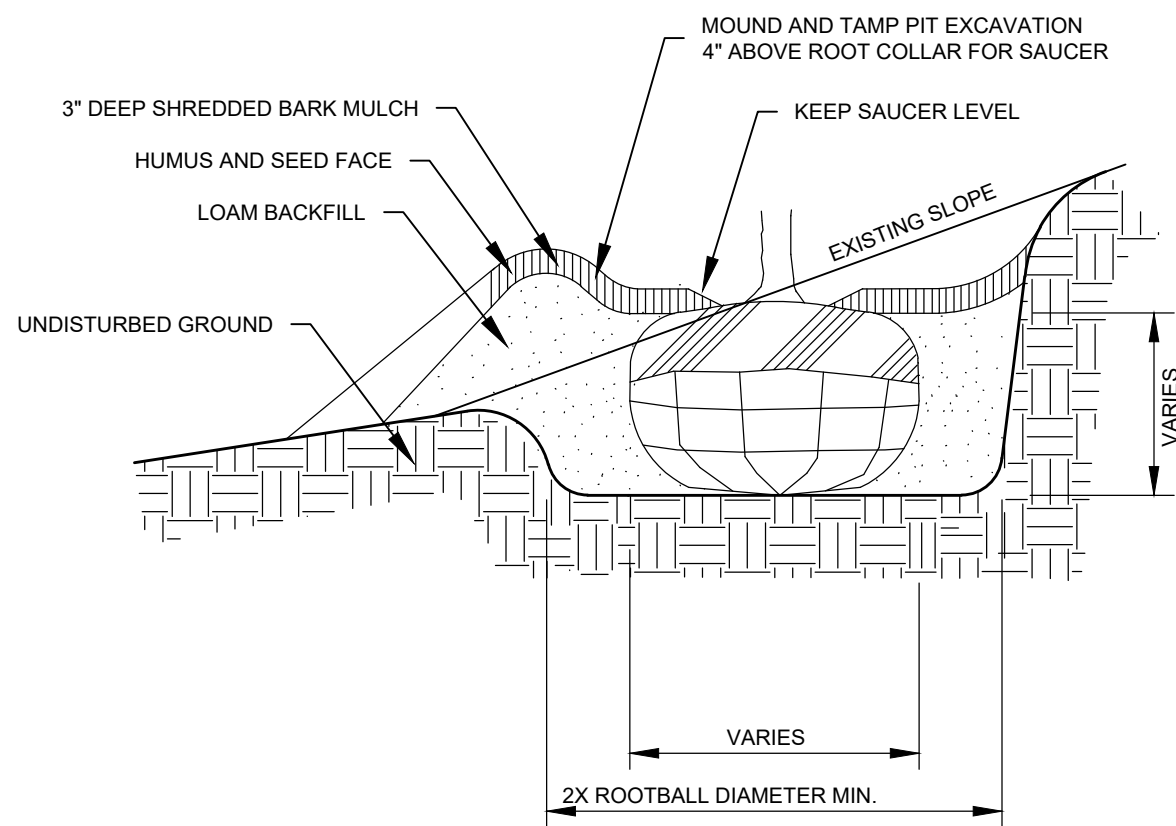
EROSION BLANKET SLOPE INSTALLTION

NOT TO SCALE

SLOPE INSTALLATION DETAIL

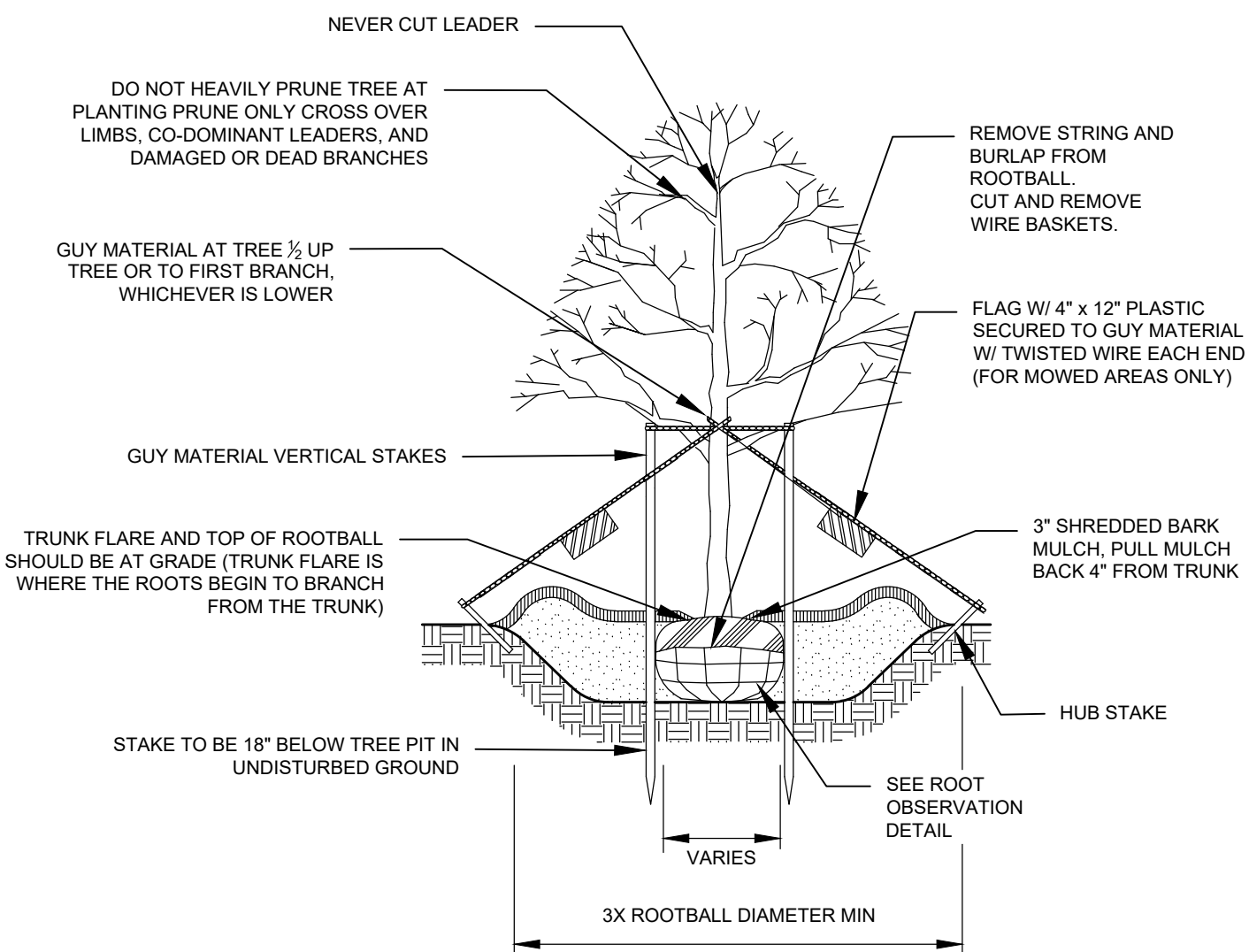
1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6" (15cm) deep X 6" (15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12" (30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12" (30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12" (30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3" (7.5cm) overlap. Staple through overlapped area, approximately 12" (30cm) apart across entire RECPs width.

*NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6" (15cm) may be necessary to properly secure the RECPs.



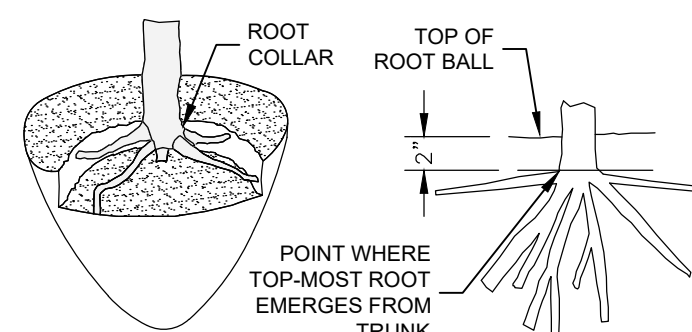
TYPICAL PLANTING PIT ON SLOPE 4:1 OR GREATER

NOT TO SCALE

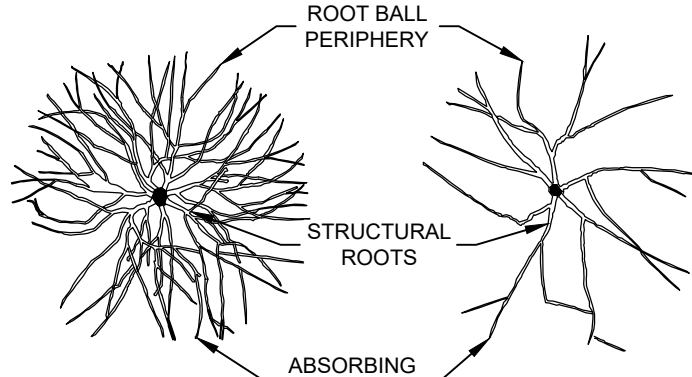


DECIDUOUS TREE PLANTING

NOT TO SCALE



THE POINT WHERE TOP-MOST ROOT(S) EMERGES FROM THE TRUNK (ROOT COLLAR) SHOULD BE WITHIN THE TOP 2" OF SUBSTRATE. THE ROOT COLLAR AND THE ROOT BALL INTERIOR SHOULD BE FREE OF DEFECTS INCLUDING CIRCLING, KINKED, ASCENDING, AND STEM GIRDLING ROOTS. STRUCTURAL ROOTS SHALL REACH THE PERIPHERY NEAR THE TOP OF THE ROOT BALL.

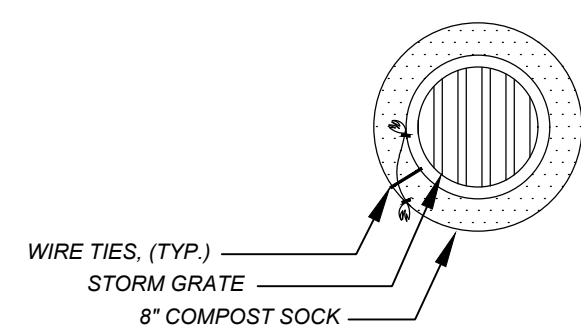


ACCEPTABLE

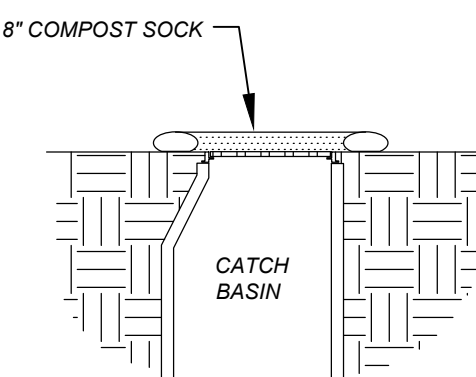
- NOTES:
1. OBSERVATIONS OF ROOTS SHALL OCCUR PRIOR TO ACCEPTANCE. ROOTS AND SOIL MAY BE REMOVED DURING THE OBSERVATION PROCESS; SUBSTRATE/SOIL SHALL BE REPLACED AFTER THE OBSERVATIONS HAVE BEEN COMPLETED.

ROOT OBSERVATION

NOT TO SCALE



DRAIN INLET PLAN

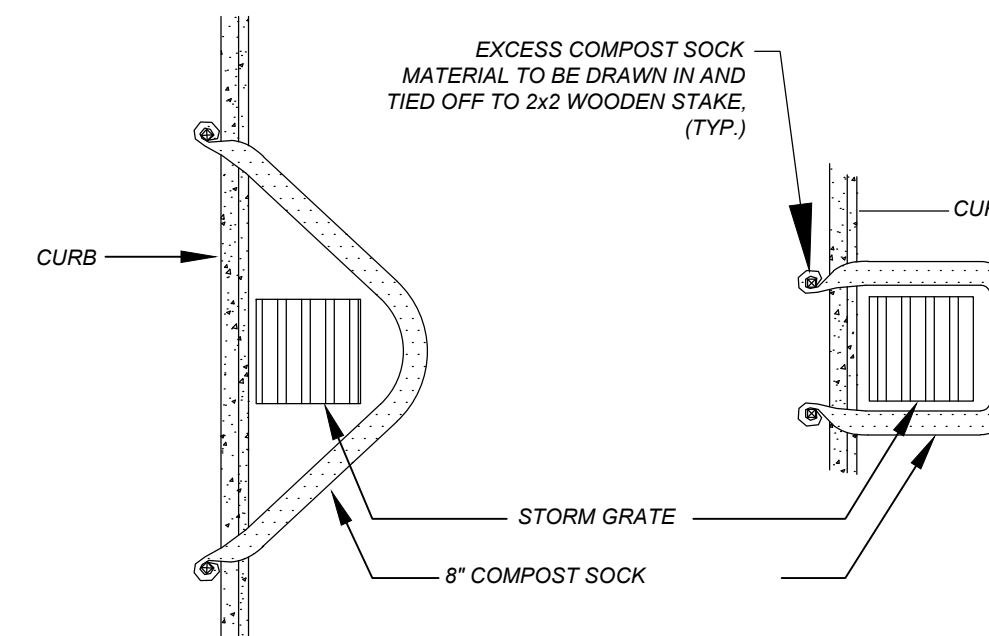


DRAIN INLET SECTION

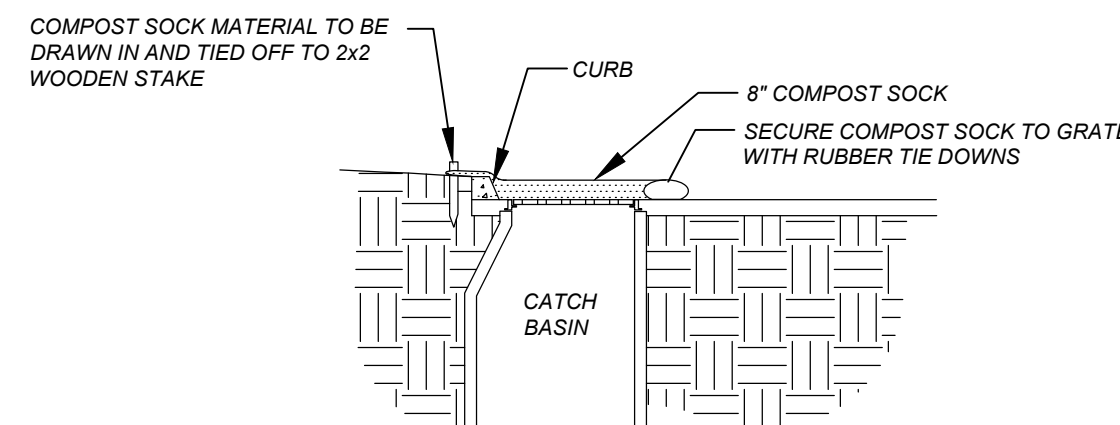
- NOTES:
1. ALL MATERIAL TO BE APPROVED BY ENGINEER.
 2. FILTER MEDIA SHALL BE A COURSE COMPOSTED MATERIAL APPROVED BY ENGINEER.
 3. FILTER MEDIA TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

SEDIMENT ROLL INLET PROTECTION

NOT TO SCALE



CURBSIDE OPTION "A" PLAN



CURBSIDE OPTION "B" PLAN

CURBSIDE SECTION

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REVISION HISTORY

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Owner

P&D REALTY

109 REFLECTION DR
SANDWICH, MA

Site

D'AGOSTINO'S DELICATESSEN

1297 MASS. AVE.
ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Construction & Erosion Control Details

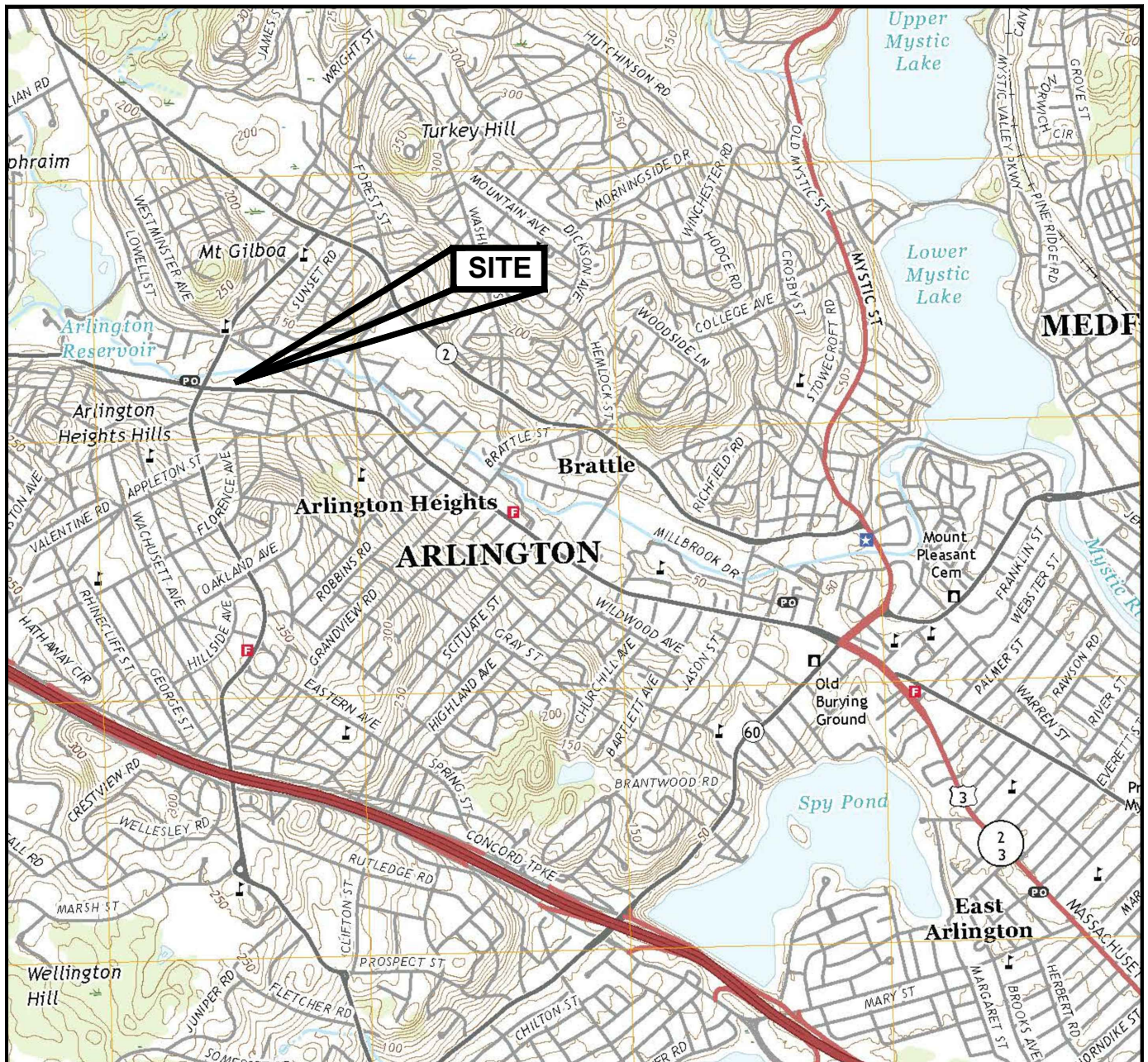
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Drafted By	RSR	Checked By	DLF
Project Mgr	RWB	Project Number	PDRE0001

Sheet Number

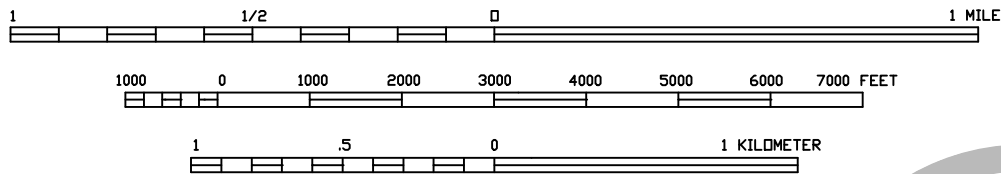
SEAL OF THE COMMONWEALTH OF MASSACHUSETTS
DAVID L. FROTHINGHAM III
REGISTERED PROFESSIONAL ENGINEER
MA P.E. #53592

C5.1

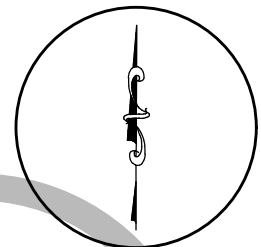
2 of 2



SCALE: 1:24,000



CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

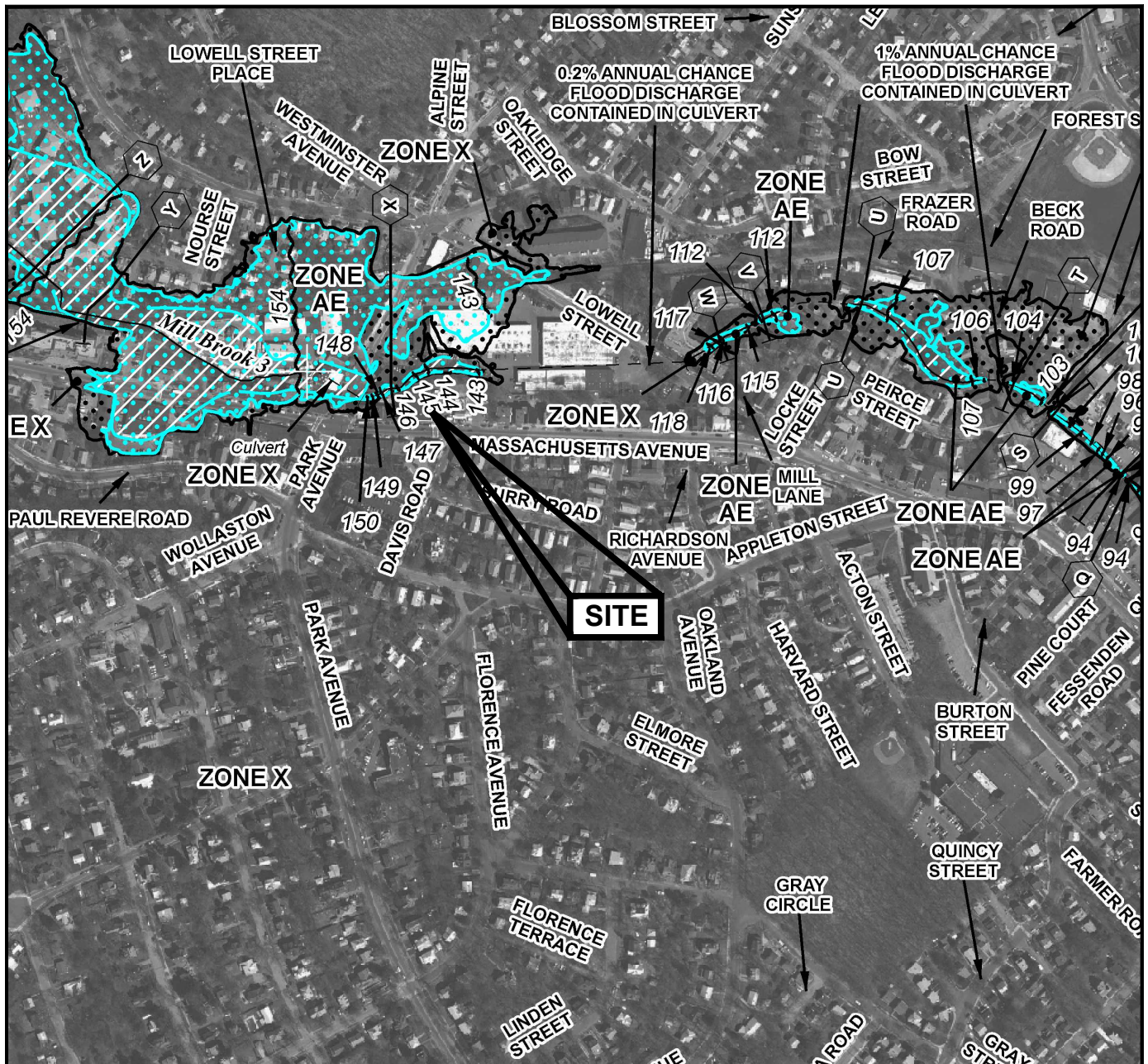


DATE MAR. 4, 2020	SCALE As shown	FILE Site Location Map
APPROVED BY RWB	DRAWN BY RSR	REVISED
CLIENT P&D Realty	JOB NUMBER PDRE0001	
LOCATION D'agostino's Food Store 1297 Massachusetts Ave. Arlington, MA 02476	MAP SOURCE Lexington, MA USGS QUAD 2018	

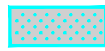
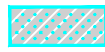
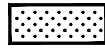
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SITE LOCATION MAP

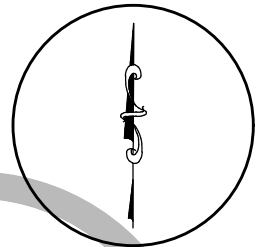
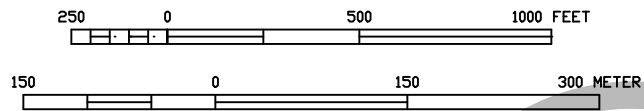
Figure 1



LEGEND

-  1% ANNUAL CHANCE FLOOD
-  ZONE AE
-  ZONE X

SCALE: 1" = 500'



DATE MAR. 04, 2020	SCALE As shown	FILE Floodplain Map
APPROVED BY ERL	DRAWN BY RSR	REVISED
CLIENT P&D Realty	JOB NUMBER PDRE0001	
LOCATION D'agostino's Food Store 1297 Massachusetts Ave. Arlington, MA 02476	MAP SOURCE FIRM Flood Insurance Rate Map Map No.: 25017C0416E June 4, 2010	

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FLOODPLAIN MAP

Figure 2

SITE PHOTOS



Figure 1: Northern view of front of grease trap and trash compactor.



Figure 2: Southern view of eastern side of trash compactor.



Figure 3: Northern view of front of grease trap.



Figure 4: Northeastern view of rear of grease trap.



Figure 5: Western view of top of bank behind grease trap.



Figure 6: Eastern view of top of bank behind grease trap.



Figure 7: Northern view of bank behind grease trap.



Figure 8: Southern view of bank behind grease trap.

April 29, 2020

Emily Sullivan
Environmental Planner & Conservation Agent
Town of Arlington Conservation Commission
730 Massachusetts Avenue, Annex
Arlington, Massachusetts 02476

**RE: Response to Conservation Commission Comments
D'Agostino's Delicatessen
1297 Massachusetts Avenue, Arlington, MA**

Dear Ms. Sullivan,

Wilcox & Barton, Inc. is pleased to submit this letter addressing the comments provided in the Conservation Commission public hearing held on April 16, 2020. Enclosed please find electronic copies of the revised site plans, weekly inspection record form for the subject property, and an applicable portion of a Massachusetts Office of Coastal Zone Management (CZM) list of native shrubs and groundcovers. The project plans have been revised as follows:

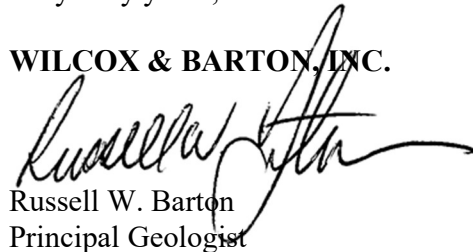
Commission Comments dated April 16, 2020

1. A weekly inspection record form for the subject property has been provided. See attached.
2. In addition to the erosion control matting and grass mix, Sweet Ferns (*Comptonia Peregrina*) are proposed to be planted throughout the proposed excavation area as specified on sheets C1.1 and C5.1. See the attached CZM list for details on Sweet Ferns.
3. Proposed perimeter erosion and sediment controls during construction shall be 12-inch compost socks. See sheets C1.1 and C5.1.

If you have any questions, or require additional information, please contact me at (603) 369-4190 x502.

Very truly yours,

WILCOX & BARTON, INC.



Russell W. Barton
Principal Geologist

Attachments: Revised Site Plan Sheets
- C1.1 Site Plan
- C5.1 Construction & Erosion Control Details
Weekly Inspection Record Form
CZM Native Shrubs and Groundcovers List

WEEKLY INSPECTION RECORD
D'Agostino's Food Store - Used Vegetable Oil Storage Container
1297 Massachusetts Avenue
Arlington, Massachusetts 02476

Current Inspection Date _____
 Previous Inspection Date _____
 Note: NA = not applicable

Inspector: _____
 Previous Action Issues Addressed: YES _____ NO _____

Include any required action items in comments.

Storage Container Name
Storage Area Containment <div style="margin-left: 40px;"> Container free of rust, weeps, wet spots, or excessive dents Area around container free from debris Container free from threats of snow or ice Container properly position Container openings properly sealed Is container accessible Oil staining below lid or on tank exterior Percentage full upon inspection </div>

Grease Container		
YES	NO	NA
_____ %		

*Container to be emptied when 90% full.

GENERAL
<div style="margin-left: 100px;"> Container due to be pumped out Container lid locked </div> <div style="margin-left: 20px; margin-top: 10px;"> Other: _____ </div>

YES	NO	NA

Inspector's Signature

Date

Comments: _____

Page _____

Scheduled container replacement date is 2030.

Coastal Landscaping in Massachusetts

Plant Highlights and Images: Shrubs and Groundcovers

This PDF document provides graphics and additional information to supplement the Massachusetts Office of Coastal Zone Management (CZM) [Coastal Landscaping Website](#).

The following list provides descriptions and photographs of some of the most common and useful shrubs and groundcovers appropriate for coastal landscaping projects in Massachusetts. Unless otherwise noted, the listed plants are *native* to Massachusetts. For more coastal plants, see [Plant Highlights and Images](#) for PDF fact sheets on Grasses/Perennials and Trees.

Shrubs and Groundcovers

Arrowwood Viburnum (*Viburnum dentatum*)



Photo: University of Connecticut Plant Database

Arrowwood viburnum is a dense, multi-stemmed shrub that typically grows 5 to 9 feet tall and wide. The branches are upright and spreading and arch at the tips. The leaves are either a shiny or flat dark green and turn yellow or red to red-purple in the late fall. The showy flowers are small, white, flattened clusters, which bloom late May to early June. The fruit, which can be of an intense blue color, is ornamental and a food source for birds. Arrowwood is very easy to grow, being well adapted to full sun or partial shade and to dry or fairly wet soils. Arrowwood is useful for its hardiness, as a border or screen, for naturalized plantings, to attract birds, and for difficult sites. This shrub is free from serious problems, with the only main maintenance requirement being an occasional rejuvenation pruning.

Beach Heather (*Hudsonia tomentosa*)



Photo: Richard A. Howard Image Collection, courtesy of Smithsonian Institution

Beach heather is a low-growing perennial shrub that thrives in nutritionally poor sand, therefore making it a dominant species in the dune ecosystem. Beach heather is beneficial for other plants because it enriches the soil with nitrogen. Beach heather has scaly leaves covered with fine, hair-like structures that protect the plant from moisture loss due to the wind and the sun's heat. Off the tips of the branches grow clusters of bright yellow flowers. Beach heather functions to stabilize dunes with its carpet-like surface area that catches and holds the sand in place and its network of roots that binds the sediments.

Shrubs and Groundcovers

Red Chokeberry (*Aronia arbutifolia*)



Photo: University of Connecticut Plant Database

Red chokeberry is native throughout most of the eastern United States and is found in various habitats from dry hillsides to wetland areas. This deciduous shrub grows from 6 to 10 feet tall and 3 to 5 feet wide. It is a suckering, spreading, colonizing shrub with numerous, slender stems. Red chokeberry is tolerant of partial shade and of both dry and wet sites. It can be transplanted easily and is valued for its summer flowers, persistent fruit, and colorful fall foliage. It is useful for naturalistic plantings, bank and dune stabilization, colonization and mass plantings, or borders in a garden.

Shrubby Cinquefoil (*Potentilla fruticosa*)



Photo: CZM

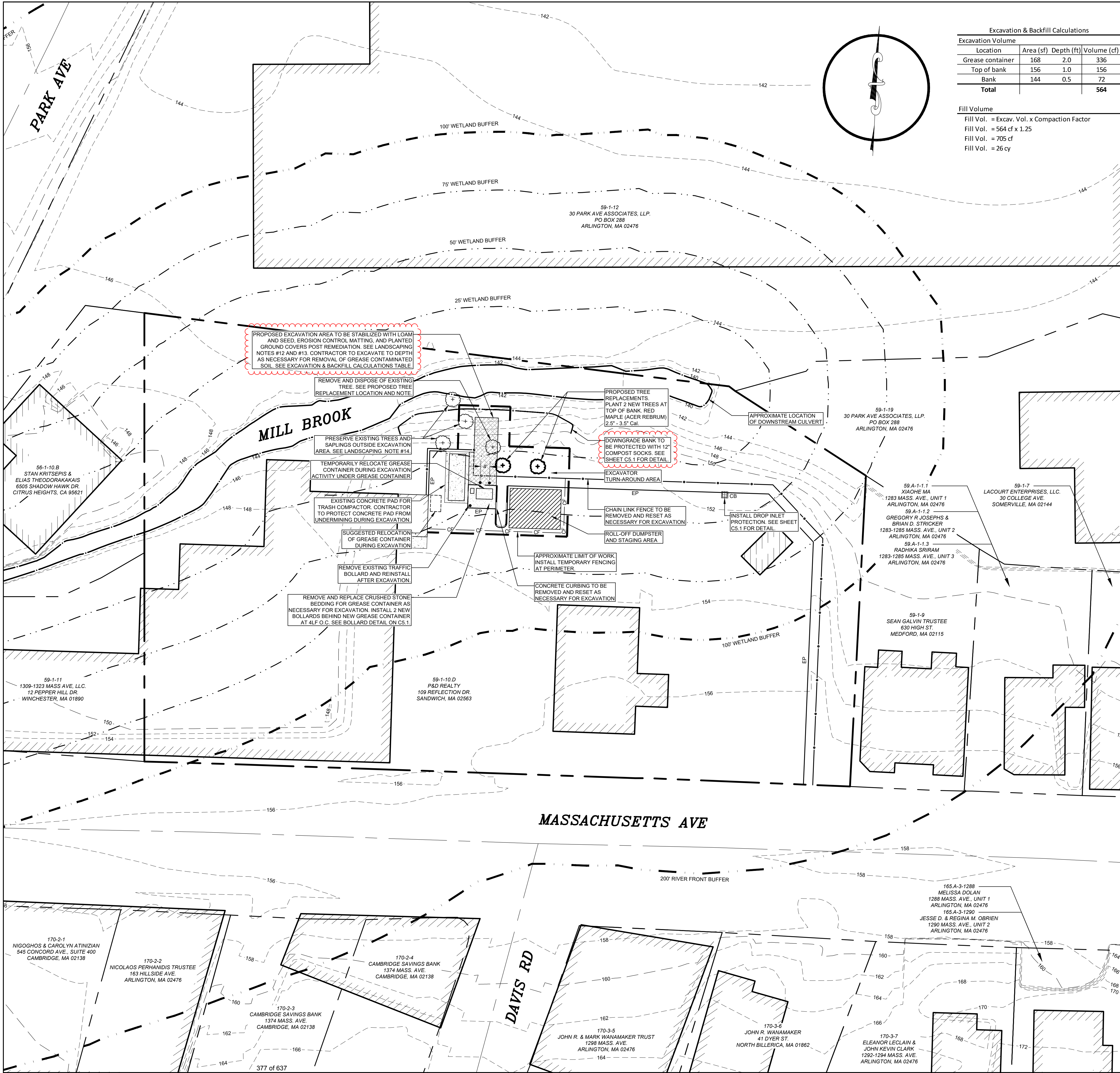
Also known as bush cinquefoil, this deciduous shrub typically grows 2 to 4 feet high and has a mound-shaped form and compound pinnate leaves. The five-petaled, bright-yellow flowers have a long blooming period, often appearing in the spring and continuing through early fall. Though shrubby cinquefoil does best in fertile, medium-moisture, well-drained soils in full sun, established plants grow well in a wide range of conditions, are fairly resistant to drought and saline soils, and are tolerant of some shade. Shrubby cinquefoil is also very tolerant of cold. The dense growth of this shrub provides cover for wildlife, the seed capsules provide fall and winter food for birds, and the flowers provide an excellent source of nectar for bees and butterflies. The variety 'Pink Beauty' is shown in the photograph.

Sweet Fern (*Comptonia peregrina*)



Photo: CZM

Sweet fern is a low-growing, deciduous native shrub that is 2 to 4 feet in height, with sweet-scented, fern-like leaves that are particularly aromatic when crushed. Sweet fern is a loosely branched, spreading, and colonizing plant. The flowers are small, inconspicuous catkins that bloom from April to May. Sweet fern is extremely cold hardy and prefers acidic, sandy, or peaty soils with low fertility, but does not tolerate shading. Sweet fern produces many underground stems or rhizomes, making it an effective groundcover for erosion control on steep, sandy banks and for species diversity in sterile, sandy soils.



Excavation & Backfill Calculations			
Excavation Volume			
Location	Area (sf)	Depth (ft)	Volume (cf)
Grease container	168	2.0	336
Top of bank	156	1.0	156
Bank	144	0.5	72
Total			564

Fill Volume
Fill Vol. = Excav. Vol. x Compaction Factor
Fill Vol. = 564 cf x 1.25
Fill Vol. = 705 cf
Fill Vol. = 26 cy

LEGEND	
	PROPERTY LINE
	ABUTTER'S PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	BUILDINGS
	ROADWAY CENTERLINE
	EDGE OF PAVEMENT
	CURB
	CONCRETE PAD
	CHAIN LINK FENCE
	EDGE OF WETLAND/WATERWAY
	200' RIVERFRONT BUFFER
	100' WETLAND/WATERWAY BUFFER
	WETLAND/WATERWAY BUFFER
	TEMPORARY FENCE
	COMPOST SOCKS
	LIMIT OF WORK
	CATCH BASINS
	INLET PROTECTION
	DECIDUOUS TREES

GENERAL NOTES:

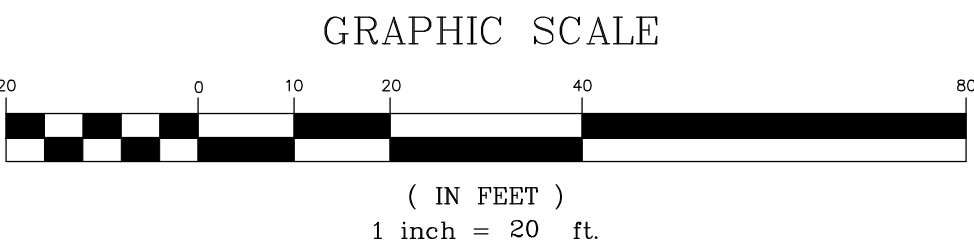
- EXISTING CONDITIONS, NORTH ORIENTATION, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON DATA COLLECTED AND PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES. 1.1. STRUCTURES LAYER UPDATED AUGUST 2019 1.2. TAX PARCELS LAYER UPDATED JANUARY 2020 1.3. ROAD CENTER LINES LAYER UPDATED NOVEMBER 2018
- TOPOGRAPHICAL INFORMATION PROVIDED BY THE TOWN OF ARLINGTON, MA GIS DATA "2-FOOT ELEVATION CONTOURS" DATED 2018.
- CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF WALLS AND/OR SHORING OF EXCAVATIONS DURING CONSTRUCTION.
- THE CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS AND SUBMITTALS BEFORE SUBMISSION TO THE ENGINEER. THUS, PROVIDING ANY INFORMATION REQUIRED OF THE FABRICATOR SUCH AS FIELD DIMENSIONS, ELEVATIONS, ETC. OTHERWISE THE SHOP DRAWINGS OR SUBMITTALS WILL BE REJECTED UNTIL SUCH INFORMATION IS FURNISHED BY THE CONTRACTOR.
- BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT. ASTM D1557.
- THE CONTRACTOR SHALL CONTACT DIG-SAFE (1-888-DIG-SAFE) AT LEAST 48 HOURS AND LESS THAN 30 DAYS PRIOR TO STARTING CONSTRUCTION AND SHALL VERIFY ALL UTILITY LOCATIONS IN THE FIELD.
- CONTRACTOR WILL NOTIFY ENGINEERS IMMEDIATELY IF SITE CONDITIONS DIFFER FROM WHAT IS SHOWN ON PLAN.

LANDSCAPING NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH PLANTING OPERATIONS
- LANDSCAPING CONTRACTOR SHALL RECEIVE SITE GRADE TO +/- 0.10 FOOT.
- ALL PLANT MATERIALS AND FINAL LOCATION OF ALL PLANT MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION
- IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR SHALL CONTACT OWNER'S REPRESENTATIVE FOR IMMEDIATE RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE OWNER'S REPRESENTATIVE WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE THE MATERIALS.
- CONTRACTOR SHALL FURNISH PLANT MATERIALS FREE OF PESTS OR PLANT DISEASES. PRE-SELECTED OR "TAGGED" MATERIAL MUST BE INSPECTED BY THE CONTRACTOR AND CERTIFIED AS PEST AND DISEASE FREE. IT IS THE CONTRACTOR'S OBLIGATION TO WARRANTY ALL PLANT MATERIALS.
- ALL GROUND COVERS SHALL BE TRIANGULARLY SPACED UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY EXISTING MATERIALS DAMAGED DURING PLANTING OPERATIONS.
- ALL LANDSCAPE AREAS SHALL BE COVERED WITH 2-INCHES OF ORGANIC BARK MULCH UNLESS OTHERWISE NOTED.
- AREAS SHOWN AS GROUND COVER AT THE BASE OF TREE AND SHRUB MATERIALS MUST CONFORM TO THE FOLLOWING CRITERIA. THERE SHALL BE NO GROUND COVER PLANT MATERIAL AT THE BASE OF THE TREE OR SHRUB AS FOLLOWS: A) 4-FOOT RADIUS AROUND EVERGREEN TREES, B) 3-FOOT RADIUS AROUND DECIDUOUS TREES, AND C) 2-FOOT RADIUS AROUND LARGE SHRUBS.
- FINAL PLACEMENT OF ALL PLANT MATERIALS SHALL BE SUBJECT TO APPROVAL OF OWNER'S REPRESENTATIVE PRIOR TO FINAL PLACEMENT AND BACKFILL. CONTACT OWNER'S REPRESENTATIVE 24-HOURS PRIOR TO PLACEMENT FOR APPROVAL.
- ALL DISTURBED AREAS, UNLESS OTHERWISE NOTED, TO BE LOAM, SEEDDED, AND MULCHED.
- CONTRACTOR TO USE NORTH AMERICAN GREEN BIONET SC150BN MATTING FOR ALL EROSION CONTROL MATTING. 70% STRAW / 30% COCONUT FIBER MATRIX.
- CONTRACTOR TO USE SWEET FERNS (COMPTONIA PEREGRINA) FOR ALL GROUND COVER PLANTINGS. SWEET FERNS SHALL BE PLANTED WITHIN THE EXCAVATION AREA NORTH OF THE EXISTING CHAIN LINK FENCE AND SPACED AT 2 FT TO 3 FT. SEE SHEET C5.1 FOR INSTALLATION DETAILS.
- CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREE ROOTS. IF ADDITIONAL TREES NEED TO BE IMPACTED FOR REMEDIATION ACTIVITIES CONTACT ENGINEER IMMEDIATELY.

EROSION CONTROL SEED		
SEED	BY % MASS	% GERMINATION (MIN)
WINTER RYE 80 (MIN)	80 (MIN)	85
RED FESCUE (CREEPING)	4 (MIN)	80
PERENNIAL GRASS	3 (MIN)	90
RED CLOVER	3 (MIN)	90
OTHER CROP GRASS	0.5 (MAX)	
NOXIOUS WEED SEED	0.5 (MAX)	
INERT MATTER	1.0 (MAX)	

PERMANENT SEED MIX		
SEED	BY % MASS	% GERMINATION (MIN)
RED FESCUE (CREEPING)	50	85
KENTUCKY BLUE	25	85
PERENNIAL RYE GRASS	10	90
RED TOP	10	85
LANDINO CLOVER	5	85



Wilcox & Barton INC.
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2 CAPITAL PLAZA, SUITE 305
CONCORD, NH 03301
603-369-4190
www.wilcoxandbarton.com

REVISION HISTORY
1. RESPONSE TO CONSERVATION COMMISSION COMMENTS
(04/24/2020)

Permitting

ALL DOCUMENTS PREPARED BY WILCOX & BARTON, INC. ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY WILCOX & BARTON, INC. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO WILCOX & BARTON, INC. OWNER SHALL INDEMNIFY AND HOLD HARMLESS WILCOX & BARTON, INC. FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

P&D REALTY 109 REFLECTION DR SANDWICH, MA

D'AGOSTINO'S DELICATESSEN 1297 MASS. AVE. ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Site Plan

Scale: 1" = 20'

Date: 03/04/2020

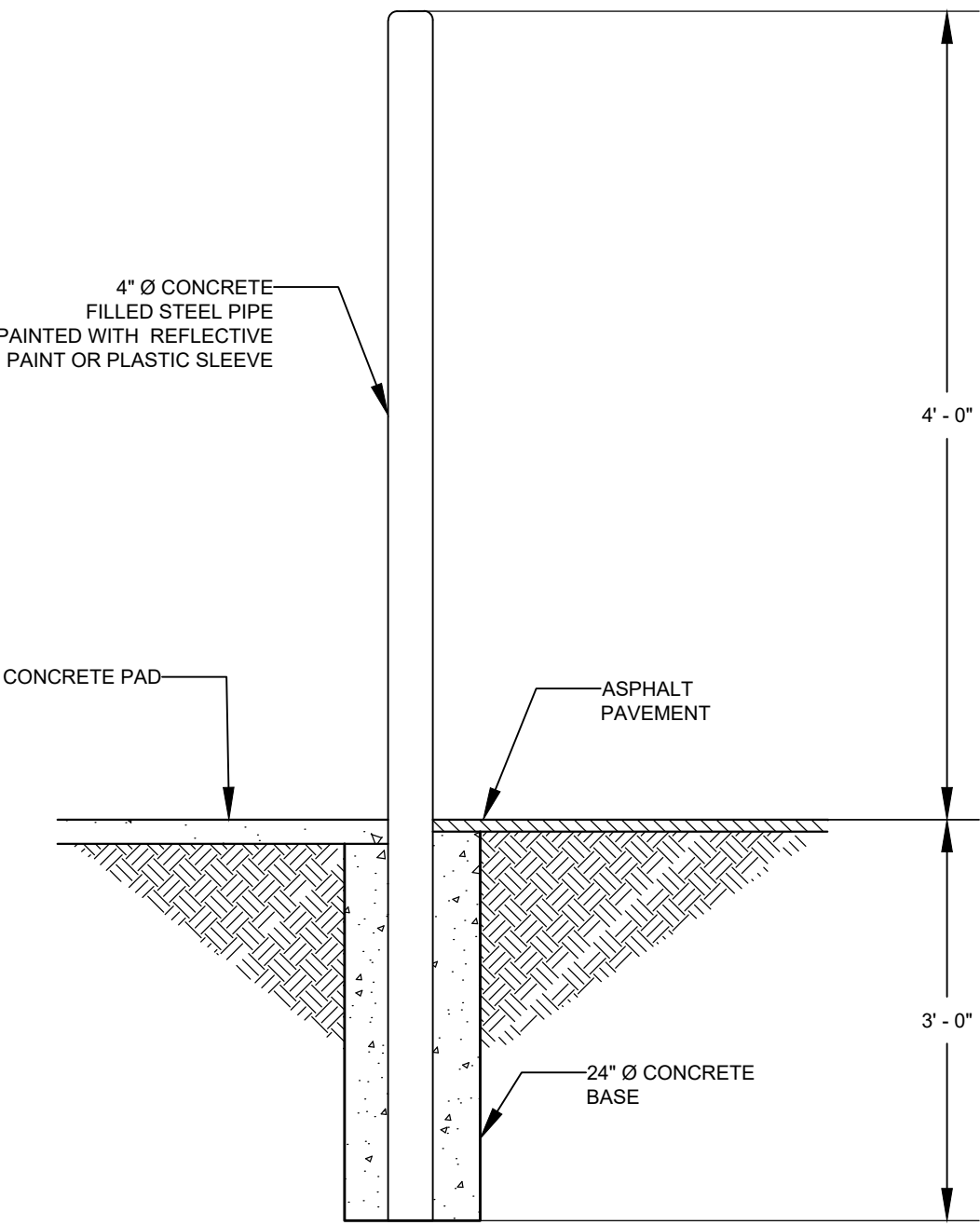
Drafted By: RSR Checked By: DLF Project Mgr: RWB Project Number: PDRE0001

Sheet Number

Seal of David L. Frothingham III, Professional Engineer, State of Massachusetts.

C1.1

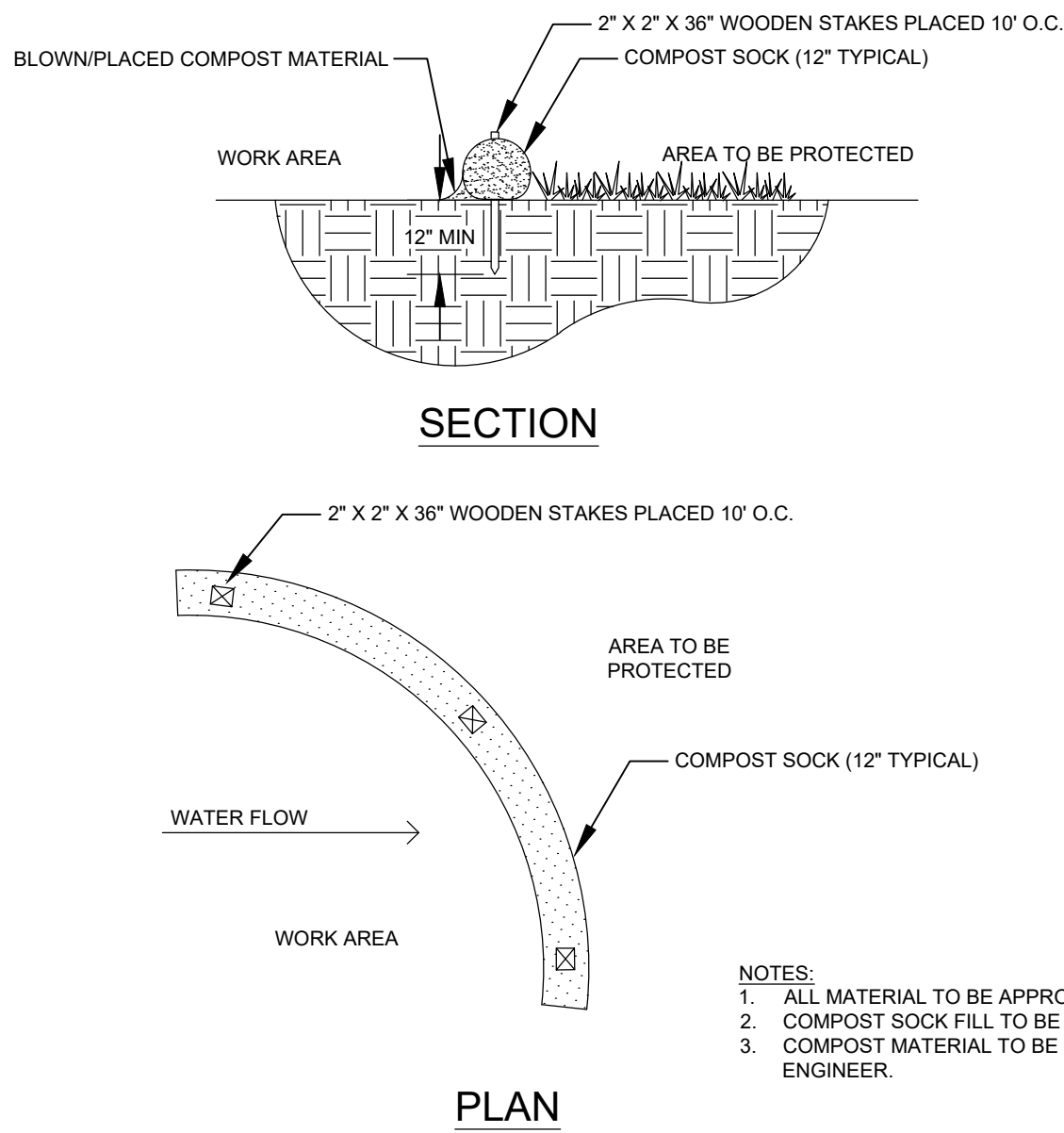
1 of 2



NOTES:
1. A PRECAST BOLLARD WHICH MEETS THE SPECIFIED DIMENSIONS MAY ALSO BE USED.

TRAFFIC BOLLARD

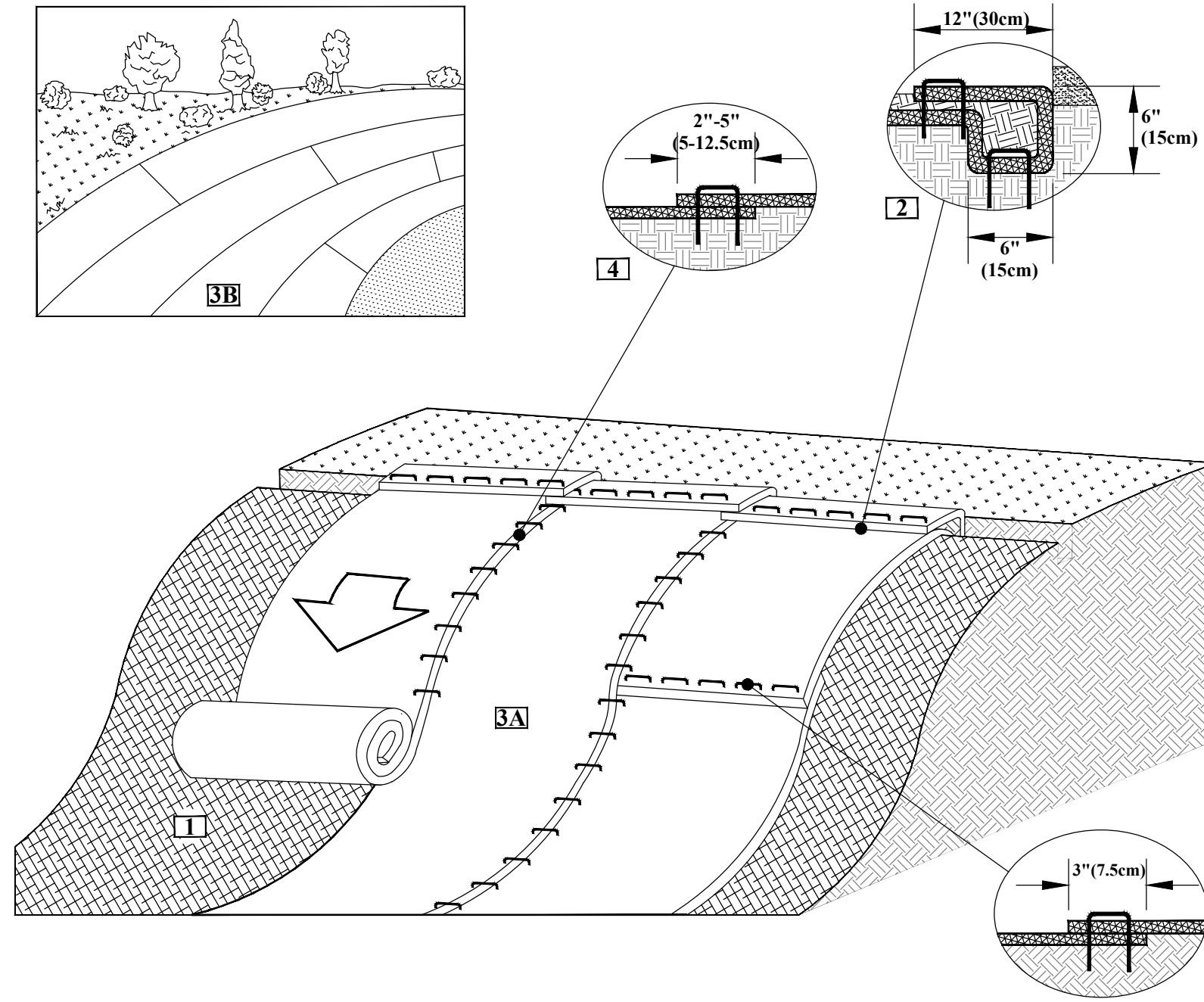
SOURCE: WILCOX & BARTON, INC.
NOT TO SCALE



NOTES:
1. ALL MATERIAL TO BE APPROVED BY ENGINEER.
2. COMPOST SOCK FILL TO BE APPROVED BY ENGINEER.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST SOCK SEDIMENT CONTROL

NOT TO SCALE



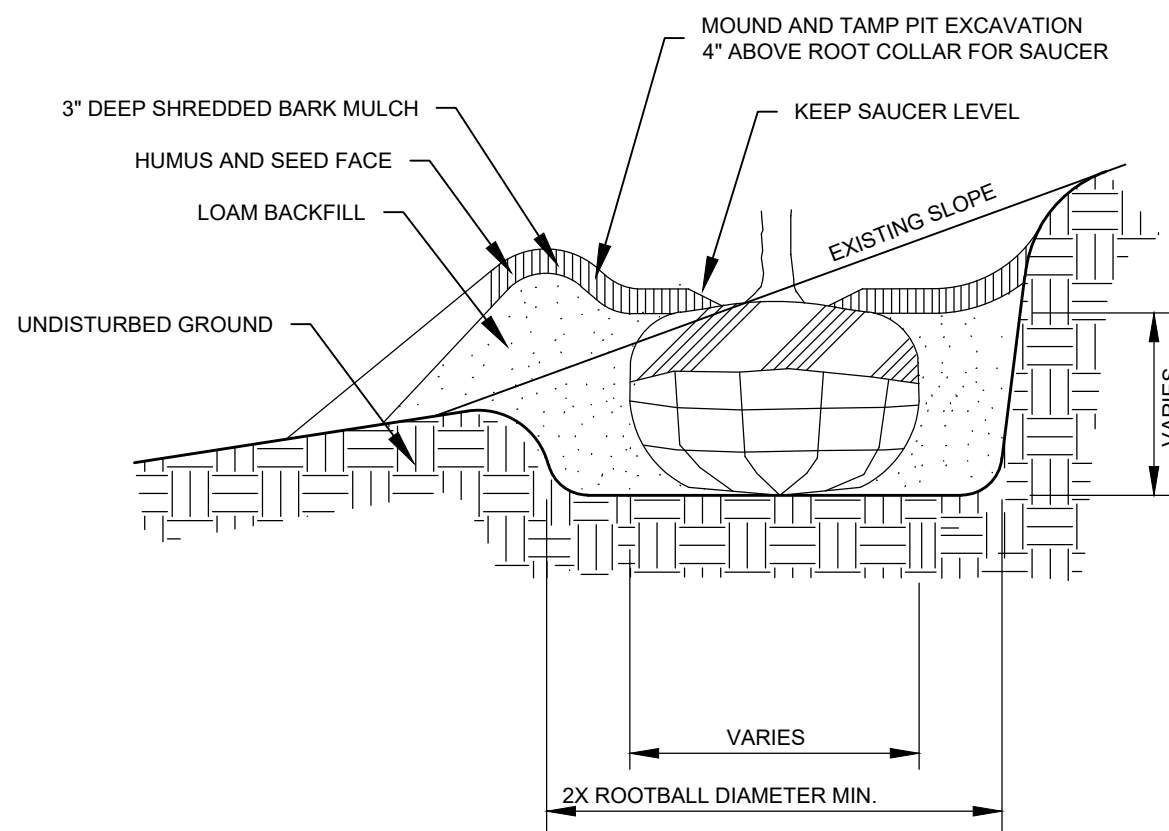
SLOPE INSTALLATION DETAIL

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6" (15cm) deep X 6" (15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12" (30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12" (30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3" (7.5cm) overlap. Staple through overlapped area, approximately 12" (30cm) apart across entire RECPs width.

*NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6" (15cm) may be necessary to properly secure the RECPs.

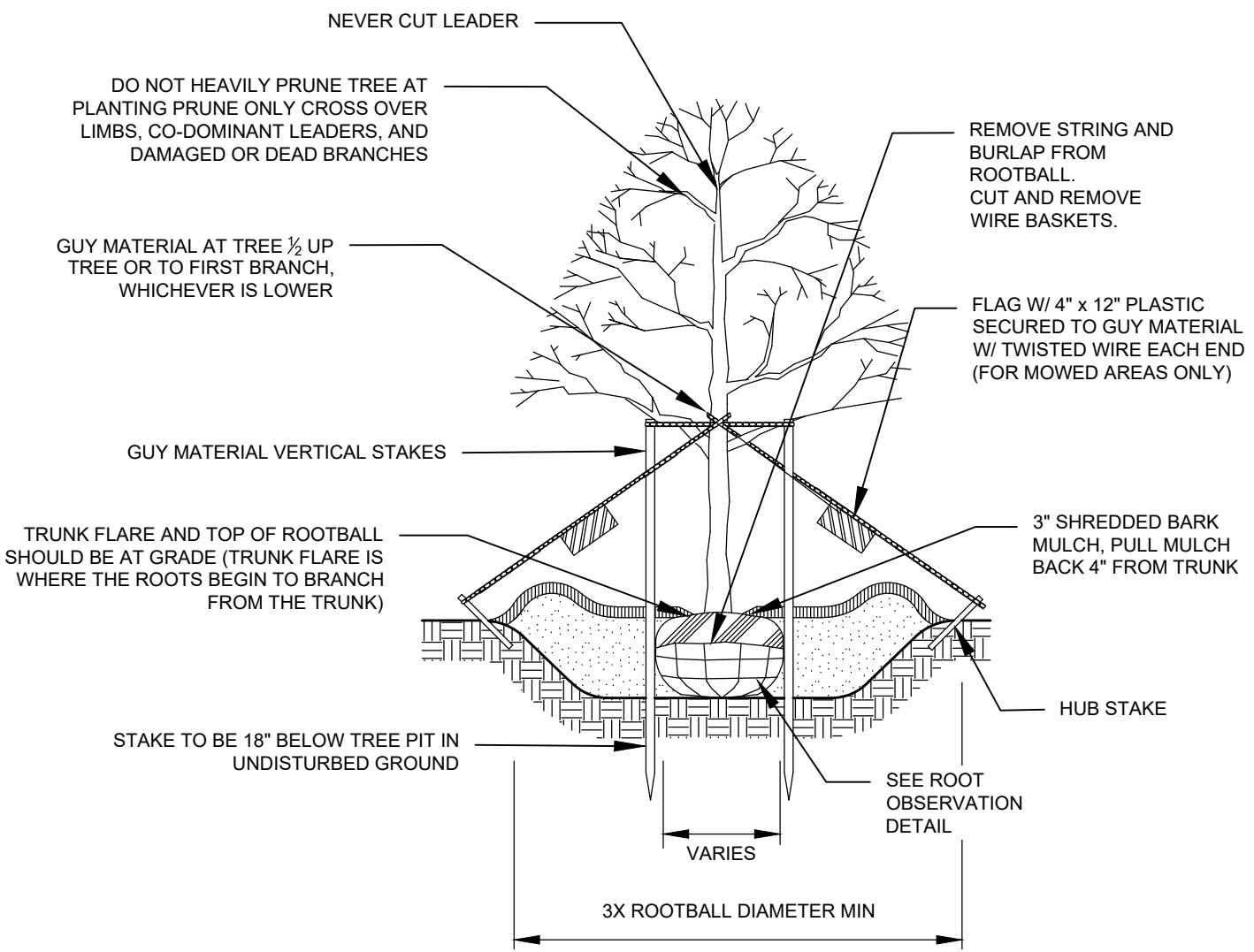
EROSION BLANKET SLOPE INSTALLTION

NOT TO SCALE



TYPICAL PLANTING PIT ON SLOPE 4:1 OR GREATER

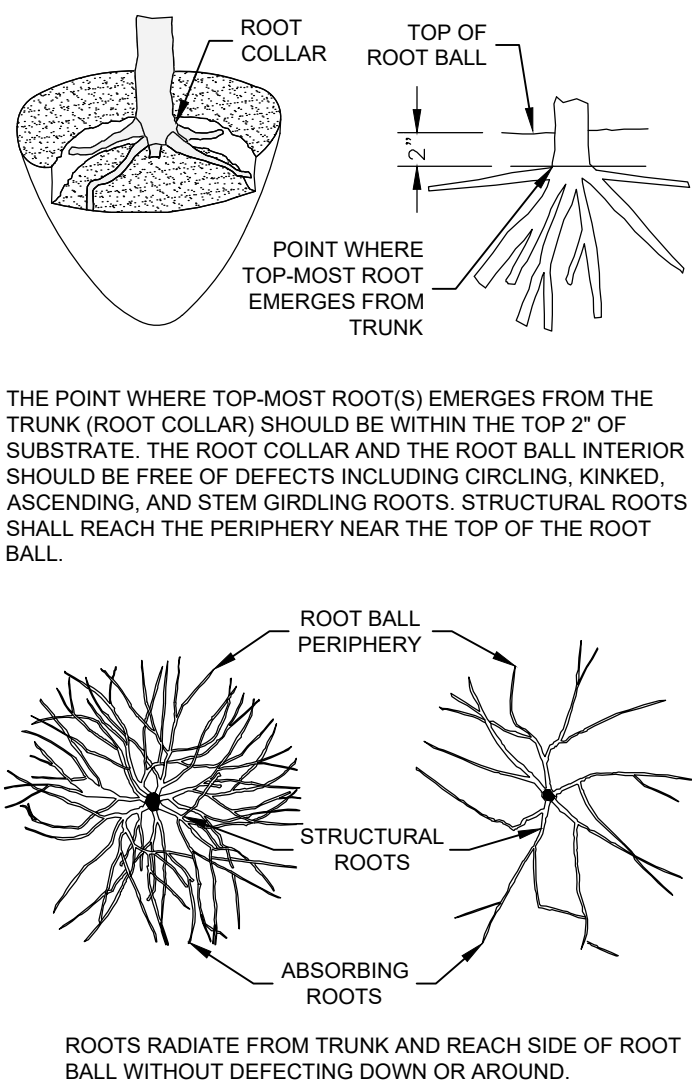
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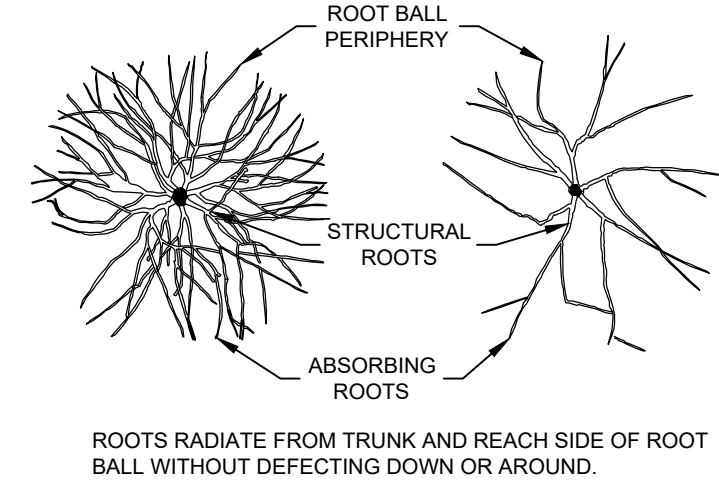
NOTES:
1. LOCAL FIELD CONDITIONS AS WELL AS PLANT CHARACTERISTICS WILL DETERMINE THE NECESSITY OF GUYING AND STAKING.
2. TYPICALLY ONLY TREES WITH A 3" OR GREATER CALIPER NEED TO BE STAKED.
3. TREE SHALL BE SET PLUMB, AFTER SETTLEMENT.
4. ALL NURSERY TAGS, TAPE, AND SIMILAR MATERIALS SHALL BE REMOVED.

DECIDUOUS TREE PLANTING

NOT TO SCALE



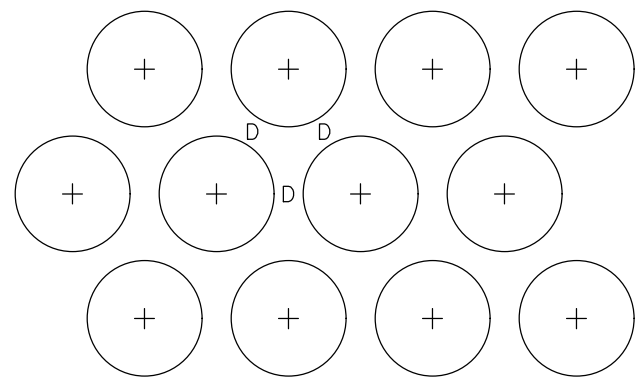
THE POINT WHERE TOP-MOST ROOT(S) EMERGES FROM THE TRUNK (ROOT COLLAR) SHOULD BE WITHIN THE TOP 2" OF SUBSTRATE. THE ROOT COLLAR AND THE ROOT BALL INTERIOR SHOULD BE FREE OF DEFECTS INCLUDING CIRCLING, KINKED, ASCENDING, AND STEM GIRDLING ROOTS. STRUCTURAL ROOTS SHALL REACH THE PERIPHERY NEAR THE TOP OF THE ROOT BALL.



NOTES:
1. OBSERVATIONS OF ROOTS SHALL OCCUR PRIOR TO ACCEPTANCE. ROOTS AND SOIL MAY BE REMOVED DURING THE OBSERVATION PROCESS; SUBSTRATE/SOIL SHALL BE REPLACED AFTER THE OBSERVATIONS HAVE BEEN COMPLETED.

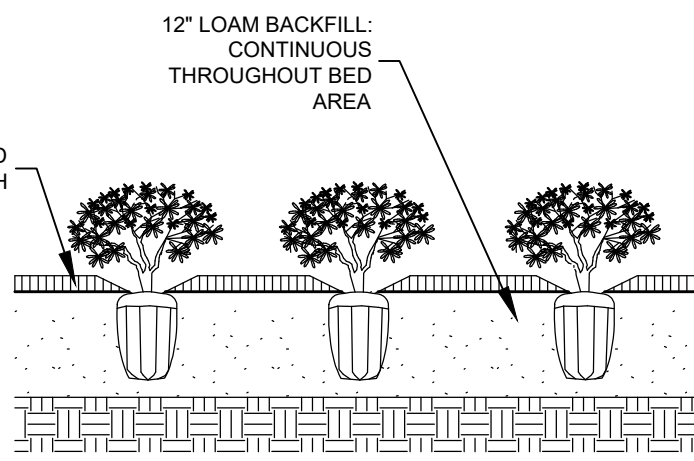
ROOT OBSERVATION

NOT TO SCALE



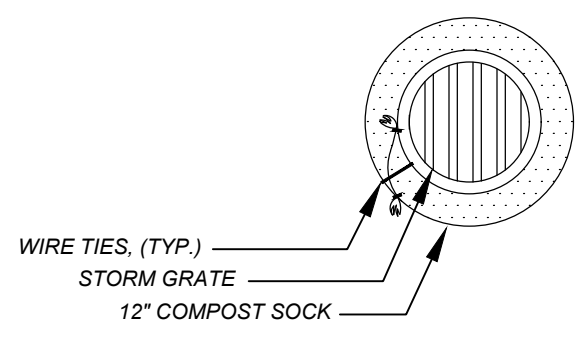
TYPICAL BED PLANT SPACING

D = DIMENSION OF PLANT SPACING (SHRUBS OR GROUND COVER AS INDICATED ON PLANS)

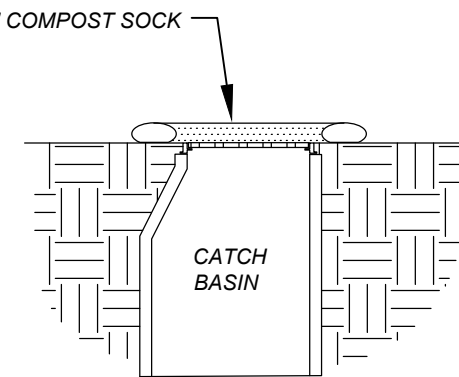


GROUND COVER BED PLANTING

NOT TO SCALE

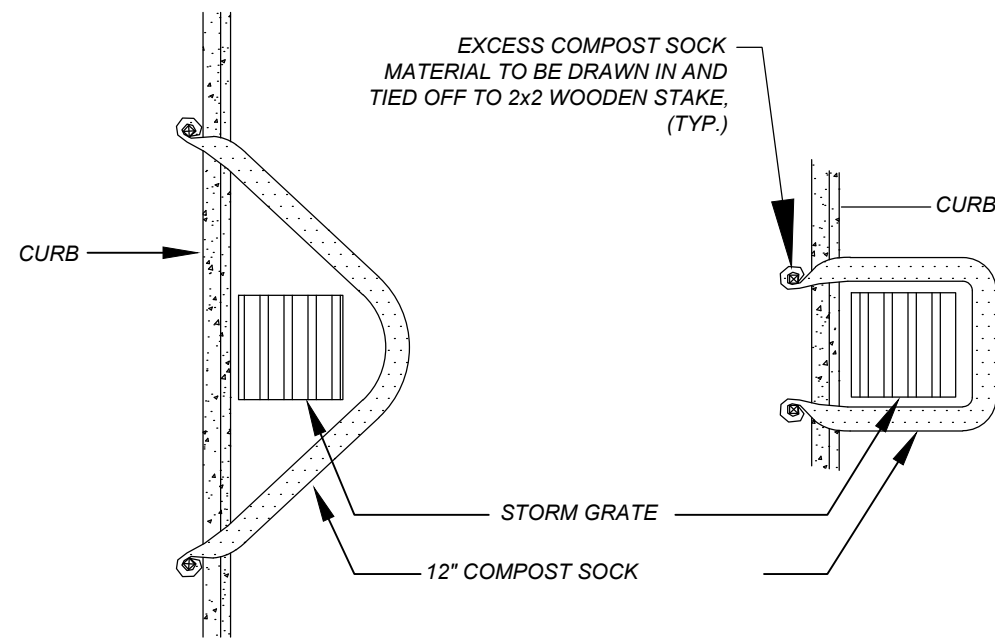


DRAIN INLET PLAN

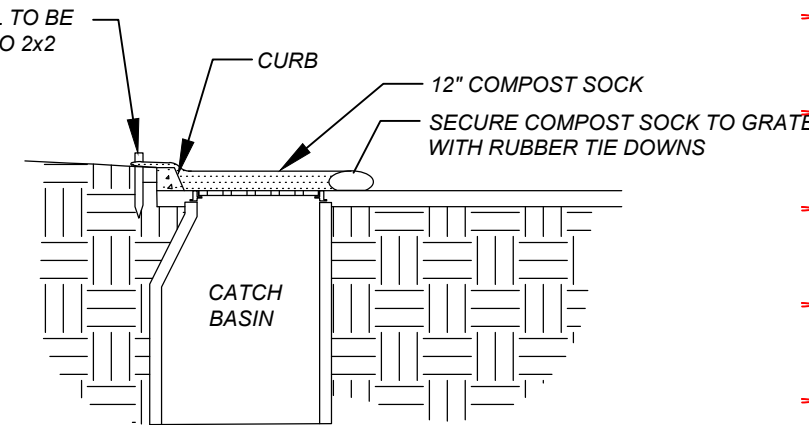


DRAIN INLET SECTION

NOTES:
1. ALL MATERIAL TO BE APPROVED BY ENGINEER.
2. FILTER MEDIA SHALL BE A COURSE COMPOSTED MATERIAL APPROVED BY ENGINEER.
3. FILTER MEDIA TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.



CURBSIDE OPTION "A" PLAN



CURBSIDE OPTION "B" PLAN

CURBSIDE SECTION

COMPOST SOCK INLET PROTECTION

NOT TO SCALE

2 CAPITAL PLAZA, SUITE 305
CONCORD, NH 03301
603-369-4190
www.wilcoxandbarton.com

REVISION HISTORY
1. RESPONSE TO CONSERVATION COMMISSION COMMENTS (04/24/2020)

Issued For

Permitting

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Owner

P&D REALTY

109 REFLECTION DR
SANDWICH, MA

Site

D'AGOSTINO'S DELICATESSEN

1297 MASS. AVE.
ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Construction & Erosion Control Details

Scale	N.T.S.	Date	03/04/2020
Drafted By	RSR	Checked By	DLF
Project Mgr	RWB	Project Number	PDRE0001

Sheet Number



ENGINEER: DAVID L. FROTHINGHAM III
MA P.E. #53592

C5.1

2 of 2

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 1297 Massachusetts Avenue
MassDEP File # 091-0321
UNDER THE WETLANDS PROTECTION ACT and ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

DOCUMENTS REVIEWED

1. Notice of Intent Packet for 1297 Massachusetts Avenue, Arlington, MA prepared by Wilcox and Barton, Inc., dated March 4, 2020.
2. Site Plan for 1297 Massachusetts Ave, prepared by Wilcox and Barton, Inc., stamped by David L Frothingham III PE #53592, dated March 4, 2020, revised May 12, 2020.
3. Construction and Erosion Control Details for 1297 Massachusetts Ave, prepared by Wilcox and Barton, Inc., stamped by David L Frothingham III PE #53592, dated March 4, 2020, revised May 12, 2020.
4. Response to First Round Conservation Comments, Supplemental Materials Packet, prepared by Wilcox and Barton, Inc., dated April 29, 2020.
5. Response to Second Round of Conservation Comments, Supplemental Materials Packet, prepared by Wilcox and Barton, Inc., dated May 12, 2020.

PROCEEDINGS

The Conservation Commission held a public hearing for the Notice of Intent on April 16, 2020 and May 7, 2020. The hearing was closed on May 7, 2020. The Commission deliberated on May 21, 2020 and voted ~~x-x-x~~ to **approve** the Project with conditions under the Wetlands Protection Act (the "Act") and voted ~~x-x-x~~ to **approve** the Project with conditions under the Arlington Wetlands Protection Bylaw (the "Bylaw").

**FINDINGS OF FACT AND LAW
UNDER ARLINGTON WETLANDS PROTECTION BYLAW
AND WETLANDS PROTECTION ACT**

- A. The project as approved involves: (1) remediating contaminated soil from a kitchen grease oil spill by removing and replacing the contaminated soil; (2) removing one existing tree and replacing it with two native trees; (3) restoring the area with native plantings; and (4) constructing two new traffic bollards behind the grease container.
- B. The project site is approximately 53,736 square feet containing two buildings with associated parking lots and driveways located at 1297 Massachusetts Avenue.
- C. The following Resource Areas are present on the site or within 100 feet of the lot lines: Bank, Adjacent Upland Resource Area ("AURA") (Bylaw), 100-ft Buffer Zone (Act), 200-ft Riverfront Area, and Mill Brook. The Commission finds accurate the delineation of Resource Areas shown on the approved plan for 1297 Massachusetts Avenue.
- D. The work proposes to remediate~~ing~~ existing soil and restore~~ing~~ the site with more native trees and vegetation than currently onsite. This ~~area of project will not increase the amount~~ impervious surface onsite ~~will remain the same as current conditions~~.
- E. As mitigation, this project proposes to plant two ~~native~~ Red Maple trees, between 2.5-~~3.02~~ 5 inch caliper. The project also proposes~~ed~~ to restore the excavated area with a ~~native~~ seed mix and ~~a native Fern variety~~.

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 1297 Massachusetts Avenue
MassDEP File # 091-0321
UNDER THE WETLANDS PROTECTION ACT AND ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

that can tolerate the slope and shade of the site conditions, which may include Sweet Fern or Cinnamon Ferns.

Comment [e1]: We asked the Applicant to select the fern type and they selected Sweet Fern

- F. As grease spill mitigation, the project proposes to implement a weekly inspection for the grease container with a standardized inspection report through which the Commission will be informed of any future grease spills. The project also proposes to install a spill kit onsite, to be used in the event of a future spill.
- G. Based on the testimony at the public hearing, and review of the application materials and the documents listed above submitted during the public hearing, the Commission concludes that the proposed Project ~~will not alter Resource Areas under the Act and Bylaw, the work~~ as conditioned will not have significant or cumulative effects upon the interests of the Wetlands Protection Act or the Resource Area values of the Arlington Wetlands Bylaw when the conditions imposed are implemented to protect the Resource Area values. With the conditions contained herein, the Project meets the performance standards in the Bylaw Regulations and State Wetlands Regulations, 310 CMR 10.00.

Comment [SC2]: I think most projects do alter the resource areas – we approve them with conditions to mitigate the alterations. We should remove this “canned” language from our OOCs.

Additional Special Conditions

In addition to the General Conditions (numbered 1 – 20 above), the Project is subject to the following Additional Special Conditions (under both the Act and Bylaw):

Pre-Construction

21. Work permitted by this Order and Permit shall conform to the Notice of Intent, the approved plans and documents (listed above), and oral representations (as recorded in hearing minutes) submitted or made by the Applicant and the Applicant’s agents or representatives, as well as any plans and other data, information or representations submitted per these Conditions and approved by the Commission.
22. The provisions of this Order and Permit shall apply to and be binding upon the Applicant and Applicant’s assignees, tenants, property management company, employees, contractors, and agents.
23. No work shall begin under this Order until: (a) all other required permits or approvals have been obtained and (b) the appeal period of ten (10) business days from the date of issue of this Order has expired without any appeal being filed, and (c) this Order has been recorded in the Registry of Deeds.
24. The Applicant shall ensure that a copy of this Order of Conditions and Permit for work, with any referenced plans, is available on site at all times, and that contractors, site managers, foremen, and sub-contractors understand its provisions.
25. Prior to starting work, the Applicant shall submit to the Commission the names and 24-hour phone numbers of project managers or the persons responsible for site work or mitigation.
26. Before work begins, erosion and sediment controls shall be installed at the limits of the work area. These will include 12 inch compost filter tubes around the entire work area (hay bales are not allowed and silt socks are preferred). The filter tubes shall be staked on the resource area side, and not through the filter tube.

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 1297 Massachusetts Avenue
MassDEP File # 091-0321
UNDER THE WETLANDS PROTECTION ACT and ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

27. The contractor shall contact the Conservation Agent (concomm@town.arlington.ma.us ; 781-316-3012) to arrange for a pre-construction meeting with the on-site project manager to walk through the Order of Conditions and walk the site to confirm the installation and placement of erosion controls prior to the start of any grading or construction work.
28. The contractor shall provide written Notice of the work start date to the Conservation Agent 48 hours prior to start of work.
29. The Commission, its employees, and its agents shall have the right of entry onto the site to inspect for compliance with the terms of this Order of Conditions and Permit until a Certificate of Compliance has been issued.

Post-Construction

30. When requesting a Certificate of Compliance for this Order of Conditions, the Applicant must submit a written statement from a either (1) Massachusetts professional engineer and registered land surveyor, or (2) registered land surveyor and landscape architect certifying that the completed work complies with the plans referenced in this Order, or provide an as-built plan and statement describing any differences.

Dumpsters

31. All dumpsters must be covered at the end of each work day, and no dumpsters will be allowed overnight within the 100 foot Buffer Zone or Adjacent Upland Resource Areas ("AURA") or other Resource Areas.

Stockpiling

32. No uncovered stockpiling of materials shall be permitted overnight within 100 feet of any waterway or water body. Stockpiling shall occur only where noted on approved plans.

Erosion Control

33. Areas that are disturbed by construction and access activities shall as soon as possible be brought to final grade and reseeded and restabilized, and shall be done so prior to the removal of erosion control barriers.
34. Erosion control measures shall be installed per the approved plans, including 12-inch compost socks staked on the resource area side of the site and confirmed during the pre-construction inspection.

Equipment

35. No heavy equipment may be stored overnight within 50 feet of the wetland and no refueling or maintenance of machinery shall be allowed within the 100-foot Buffer Zone, 200-foot Resource Area, and Adjacent Upland Resource Area or within any Resource Area.
36. Construction entrances shall be used and maintained only where noted on approved plans.
37. Arrangements shall be made for any rinsing of tools, equipment, etc. associated with on-site mixing or use of concrete or other materials such that the waste water is disposed of in the concrete wash out

ARLINGTON CONSERVATION COMMISSION
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station-at least 50 feet from the resource area. In no case may water be discharged into or onto Resource Areas on or adjacent to the site. Any spillage of materials shall be cleaned up promptly.

Sweeping

38. Any dirt or debris spilled or tracked onto any paved streets shall be swept up and removed daily.

Plantings

39. All plantings shall be native and be installed and maintained according to the standards of the American Association of Nurserymen (AAN). **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition.**
40. All plantings planted through this project shall be maintained for three years. A survival rate of at least 75% must be maintained for the approved plantings. **The Conservation Agent shall be contacted by the Property Owner to conduct annual inspections of the plantings sometime between September 15- November 1 2021, 2022, and 2023.**

Chemicals

41. To avoid adding excess nitrogen runoff to Spy Pond/Mill Brook, the Applicant shall only treat the lawn with slow release nitrogen fertilizer. Application of this fertilizer cannot occur in the summer, or after storm events. Lawn fertilizer shall only be applied twice a year, in spring and fall. No herbicides shall be used to treat invasive or unwanted plants. New plantings shall only be fertilized once, during the initial planting year. No pesticides or rodenticides shall be used to treat pest management issues within the Wetland Buffers Zone or Riverfront Area. **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.**

Comment [e3]: PH: possibly take out since there is no lawn area, or if nothing else modify, since site does not drain to Spy Pond.

Comment [e4]: NS: Is there a lawn proposed? Maybe change this to apply to the new plantings?

Comment [e5]: The Applicant proposed a lawn mix with Sweet ferns in the excavation restoration area

Pervious Surfaces

42. Pervious surfaces shown on the project plans shall be maintained and not be replaced by impervious surfaces. **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition.**

Stormwater

43. The Applicant shall protect all adjacent catch basins using silt socks.

Grease Spill Mitigation

44. The Applicant shall implement a weekly inspection for the grease container with a standardized inspection report through which the Commission will be informed of any future grease spills. The inspection form shall be the same form submitted to the Commission in the Supplement Materials Packet dated May 12, 2020. Each completed inspection forms shall be kept and maintained in a secure location by the Applicant at the Project Site and be available for the Commission's review; each inspection form shall be kept for three years from the date of the inspection. **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition.**

ARLINGTON CONSERVATION COMMISSION
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45. The Applicant shall ~~install~~ maintain a spill kit onsite, conforming to the specifications submitted to the Commission in the Supplement Materials Packet dated May 12, 2020. **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition.**

DRAFT

April 29, 2020

Emily Sullivan
Environmental Planner & Conservation Agent
Town of Arlington Conservation Commission
730 Massachusetts Avenue, Annex
Arlington, Massachusetts 02476

**RE: Response to Conservation Commission Comments
D'Agostino's Delicatessen
1297 Massachusetts Avenue, Arlington, MA**

Dear Ms. Sullivan,

Wilcox & Barton, Inc. is pleased to submit this letter addressing the comments provided in the Conservation Commission public hearing held on April 16, 2020. Enclosed please find electronic copies of the revised site plans, weekly inspection record form for the subject property, and an applicable portion of a Massachusetts Office of Coastal Zone Management (CZM) list of native shrubs and groundcovers. The project plans have been revised as follows:

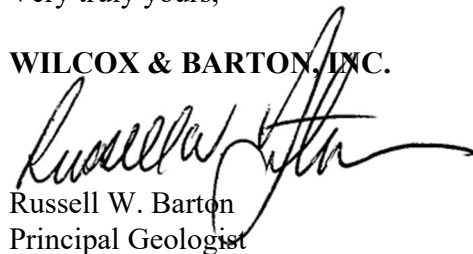
Commission Comments dated April 16, 2020

1. A weekly inspection record form for the subject property has been provided. See attached.
2. In addition to the erosion control matting and grass mix, Sweet Ferns (*Comptonia Peregrina*) are proposed to be planted throughout the proposed excavation area as specified on sheets C1.1 and C5.1. See the attached CZM list for details on Sweet Ferns.
3. Proposed perimeter erosion and sediment controls during construction shall be 12-inch compost socks. See sheets C1.1 and C5.1.

If you have any questions, or require additional information, please contact me at (603) 369-4190 x502.

Very truly yours,

WILCOX & BARTON, INC.



Russell W. Barton
Principal Geologist

Attachments: Revised Site Plan Sheets
- C1.1 Site Plan
- C5.1 Construction & Erosion Control Details
Weekly Inspection Record Form
CZM Native Shrubs and Groundcovers List

WEEKLY INSPECTION RECORD
D'Agostino's Food Store - Used Vegetable Oil Storage Container
1297 Massachusetts Avenue
Arlington, Massachusetts 02476

Current Inspection Date _____
 Previous Inspection Date _____
 Note: NA = not applicable

Inspector: _____
 Previous Action Issues Addressed: YES _____ NO _____

Include any required action items in comments.

Storage Container Name
Storage Area Containment <div style="margin-left: 40px;"> Container free of rust, weeps, wet spots, or excessive dents Area around container free from debris Container free from threats of snow or ice Container properly position Container openings properly sealed Is container accessible Oil staining below lid or on tank exterior Percentage full upon inspection </div>

Grease Container		
YES	NO	NA
_____ %		

*Container to be emptied when 90% full.

GENERAL
<div style="margin-left: 100px;"> Container due to be pumped out Container lid locked </div> <div style="margin-left: 20px; margin-top: 10px;"> Other: _____ </div>

YES	NO	NA

Inspector's Signature

Date

Comments: _____

Page _____

Scheduled container replacement date is 2030.

Coastal Landscaping in Massachusetts

Plant Highlights and Images: Shrubs and Groundcovers

This PDF document provides graphics and additional information to supplement the Massachusetts Office of Coastal Zone Management (CZM) [Coastal Landscaping Website](#).

The following list provides descriptions and photographs of some of the most common and useful shrubs and groundcovers appropriate for coastal landscaping projects in Massachusetts. Unless otherwise noted, the listed plants are *native* to Massachusetts. For more coastal plants, see [Plant Highlights and Images](#) for PDF fact sheets on Grasses/Perennials and Trees.

Shrubs and Groundcovers

Arrowwood Viburnum (*Viburnum dentatum*)



Photo: University of Connecticut Plant Database

Arrowwood viburnum is a dense, multi-stemmed shrub that typically grows 5 to 9 feet tall and wide. The branches are upright and spreading and arch at the tips. The leaves are either a shiny or flat dark green and turn yellow or red to red-purple in the late fall. The showy flowers are small, white, flattened clusters, which bloom late May to early June. The fruit, which can be of an intense blue color, is ornamental and a food source for birds. Arrowwood is very easy to grow, being well adapted to full sun or partial shade and to dry or fairly wet soils. Arrowwood is useful for its hardiness, as a border or screen, for naturalized plantings, to attract birds, and for difficult sites. This shrub is free from serious problems, with the only main maintenance requirement being an occasional rejuvenation pruning.

Beach Heather (*Hudsonia tomentosa*)



Photo: Richard A. Howard Image Collection, courtesy of Smithsonian Institution

Beach heather is a low-growing perennial shrub that thrives in nutritionally poor sand, therefore making it a dominant species in the dune ecosystem. Beach heather is beneficial for other plants because it enriches the soil with nitrogen. Beach heather has scaly leaves covered with fine, hair-like structures that protect the plant from moisture loss due to the wind and the sun's heat. Off the tips of the branches grow clusters of bright yellow flowers. Beach heather functions to stabilize dunes with its carpet-like surface area that catches and holds the sand in place and its network of roots that binds the sediments.

Shrubs and Groundcovers

Red Chokeberry (*Aronia arbutifolia*)



Photo: University of Connecticut Plant Database

Red chokeberry is native throughout most of the eastern United States and is found in various habitats from dry hillsides to wetland areas. This deciduous shrub grows from 6 to 10 feet tall and 3 to 5 feet wide. It is a suckering, spreading, colonizing shrub with numerous, slender stems. Red chokeberry is tolerant of partial shade and of both dry and wet sites. It can be transplanted easily and is valued for its summer flowers, persistent fruit, and colorful fall foliage. It is useful for naturalistic plantings, bank and dune stabilization, colonization and mass plantings, or borders in a garden.

Shrubby Cinquefoil (*Potentilla fruticosa*)



Photo: CZM

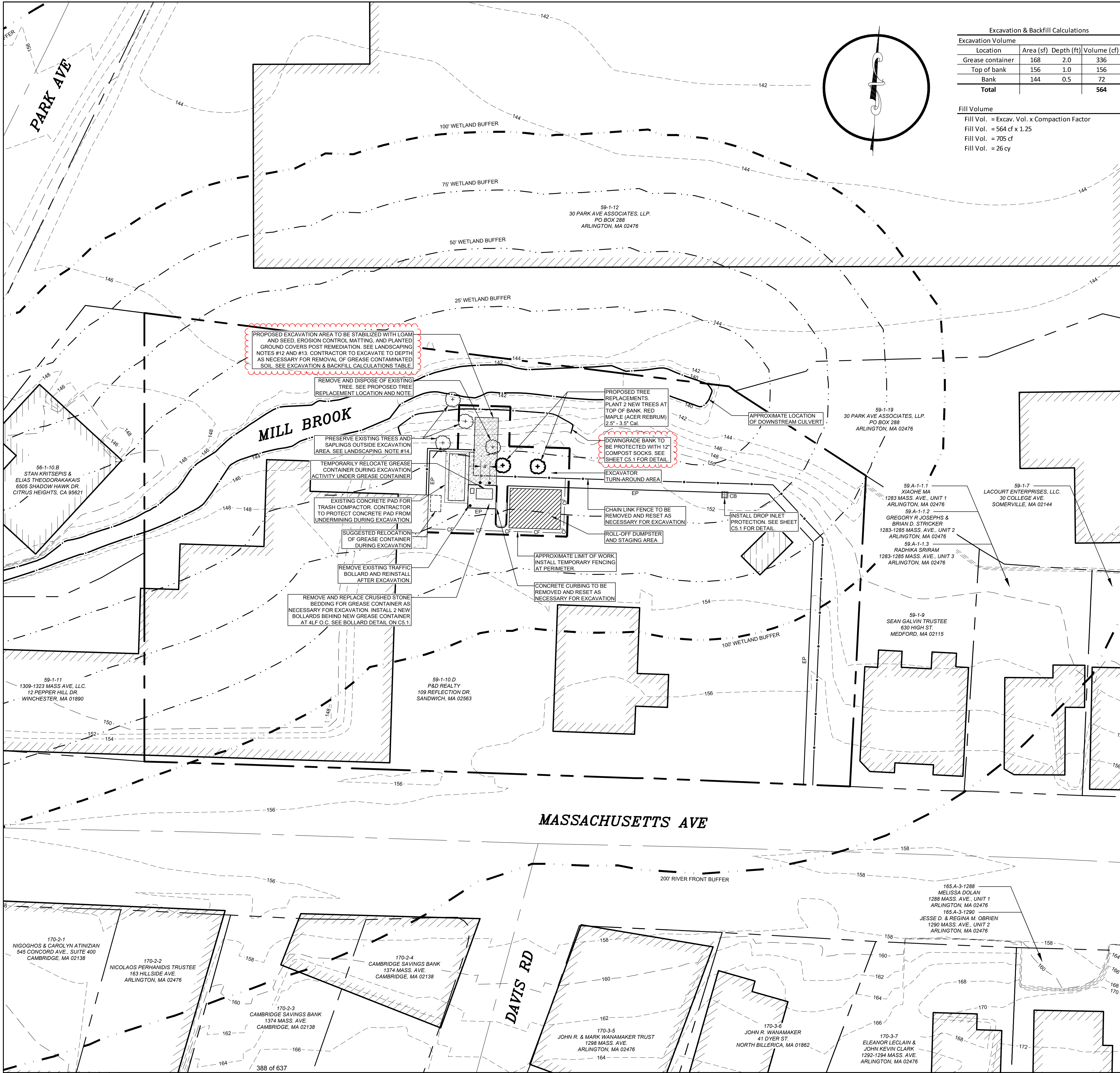
Also known as bush cinquefoil, this deciduous shrub typically grows 2 to 4 feet high and has a mound-shaped form and compound pinnate leaves. The five-petaled, bright-yellow flowers have a long blooming period, often appearing in the spring and continuing through early fall. Though shrubby cinquefoil does best in fertile, medium-moisture, well-drained soils in full sun, established plants grow well in a wide range of conditions, are fairly resistant to drought and saline soils, and are tolerant of some shade. Shrubby cinquefoil is also very tolerant of cold. The dense growth of this shrub provides cover for wildlife, the seed capsules provide fall and winter food for birds, and the flowers provide an excellent source of nectar for bees and butterflies. The variety 'Pink Beauty' is shown in the photograph.

Sweet Fern (*Comptonia peregrina*)



Photo: CZM

Sweet fern is a low-growing, deciduous native shrub that is 2 to 4 feet in height, with sweet-scented, fern-like leaves that are particularly aromatic when crushed. Sweet fern is a loosely branched, spreading, and colonizing plant. The flowers are small, inconspicuous catkins that bloom from April to May. Sweet fern is extremely cold hardy and prefers acidic, sandy, or peaty soils with low fertility, but does not tolerate shading. Sweet fern produces many underground stems or rhizomes, making it an effective groundcover for erosion control on steep, sandy banks and for species diversity in sterile, sandy soils.



Excavation & Backfill Calculations			
Excavation Volume			
Location	Area (sf)	Depth (ft)	Volume (cf)
Grease container	168	2.0	336
Top of bank	156	1.0	156
Bank	144	0.5	72
Total			564

Fill Volume
Fill Vol. = Excav. Vol. x Compaction Factor
Fill Vol. = 564 cf x 1.25
Fill Vol. = 705 cf
Fill Vol. = 26 cy

LEGEND	
	PROPERTY LINE
	ABUTTER'S PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	BUILDINGS
	ROADWAY CENTERLINE
	EDGE OF PAVEMENT
	CURB
	CONCRETE PAD
	CHAIN LINK FENCE
	EDGE OF WETLAND/WATERWAY
	200' RIVERFRONT BUFFER
	100' WETLAND/WATERWAY BUFFER
	WETLAND/WATERWAY BUFFER
	TEMPORARY FENCE
	COMPOST SOCKS
	LIMIT OF WORK
	CATCH BASINS
	INLET PROTECTION
	DECIDUOUS TREES

GENERAL NOTES:

- EXISTING CONDITIONS, NORTH ORIENTATION, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON DATA COLLECTED AND PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES. 1.1. STRUCTURES LAYER UPDATED AUGUST 2019 1.2. TAX PARCELS LAYER UPDATED JANUARY 2020 1.3. ROAD CENTER LINES LAYER UPDATED NOVEMBER 2018
- TOPOGRAPHICAL INFORMATION PROVIDED BY THE TOWN OF ARLINGTON, MA GIS DATA "2-FOOT ELEVATION CONTOURS" DATED 2018.
- CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF WALLS AND/OR SHORING OF EXCAVATIONS DURING CONSTRUCTION.

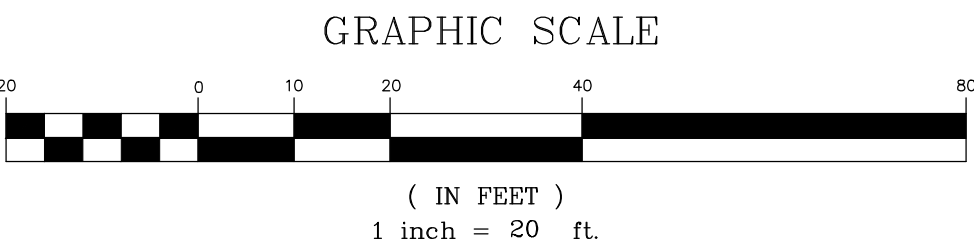
- THE CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS AND SUBMITTALS BEFORE SUBMISSION TO THE ENGINEER. THUS, PROVIDING ANY INFORMATION REQUIRED OF THE FABRICATOR SUCH AS FIELD DIMENSIONS, ELEVATIONS, ETC. OTHERWISE THE SHOP DRAWINGS OR SUBMITTALS WILL BE REJECTED UNTIL SUCH INFORMATION IS FURNISHED BY THE CONTRACTOR.
- BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT, ASTM D1557.
- THE CONTRACTOR SHALL CONTACT DIG-SAFE (1-888-DIG-SAFE) AT LEAST 48 HOURS AND LESS THAN 30 DAYS PRIOR TO STARTING CONSTRUCTION AND SHALL VERIFY ALL UTILITY LOCATIONS IN THE FIELD.
- CONTRACTOR WILL NOTIFY ENGINEERS IMMEDIATELY IF SITE CONDITIONS DIFFER FROM WHAT IS SHOWN ON PLAN.

LANDSCAPING NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH PLANTING OPERATIONS
- LANDSCAPING CONTRACTOR SHALL RECEIVE SITE GRADE TO +/- 0.10 FOOT.
- ALL PLANT MATERIALS AND FINAL LOCATION OF ALL PLANT MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION
- IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR SHALL CONTACT OWNER'S REPRESENTATIVE FOR IMMEDIATE RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE OWNER'S REPRESENTATIVE WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE THE MATERIALS.
- CONTRACTOR SHALL FURNISH PLANT MATERIALS FREE OF PESTS OR PLANT DISEASES. PRE-SELECTED OR "TAGGED" MATERIAL MUST BE INSPECTED BY THE CONTRACTOR AND CERTIFIED AS PEST AND DISEASE FREE. IT IS THE CONTRACTOR'S OBLIGATION TO WARRANTY ALL PLANT MATERIALS.
- ALL GROUND COVERS SHALL BE TRIANGULARLY SPACED UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY EXISTING MATERIALS DAMAGED DURING PLANTING OPERATIONS.
- ALL LANDSCAPE AREAS SHALL BE COVERED WITH 2-INCHES OF ORGANIC BARK MULCH UNLESS OTHERWISE NOTED.
- AREAS SHOWN AS GROUND COVER AT THE BASE OF TREE AND SHRUB MATERIALS MUST CONFORM TO THE FOLLOWING CRITERIA. THERE SHALL BE NO GROUND COVER PLANT MATERIAL AT THE BASE OF THE TREE OR SHRUB AS FOLLOWS: A) 4-FOOT RADIUS AROUND EVERGREEN TREES, B) 3-FOOT RADIUS AROUND DECIDUOUS TREES, AND C) 2-FOOT RADIUS AROUND LARGE SHRUBS.
- FINAL PLACEMENT OF ALL PLANT MATERIALS SHALL BE SUBJECT TO APPROVAL OF OWNER'S REPRESENTATIVE PRIOR TO FINAL PLACEMENT AND BACKFILL. CONTACT OWNER'S REPRESENTATIVE 24-HOURS PRIOR TO PLACEMENT FOR APPROVAL.
- ALL DISTURBED AREAS, UNLESS OTHERWISE NOTED, TO BE LOAM, SEEDED, AND MULCHED.
- CONTRACTOR TO USE NORTH AMERICAN GREEN BIONET SC150BN MATTING FOR ALL EROSION CONTROL MATTING. 70% STRAW / 30% COCONUT FIBER MATRIX.
- CONTRACTOR TO USE SWEET FERNS (COMPTONIA PEREGRINA) FOR ALL GROUND COVER PLANTINGS. SWEET FERNS SHALL BE PLANTED WITHIN THE EXCAVATION AREA NORTH OF THE EXISTING CHAIN LINK FENCE AND SPACED AT 2 FT TO 3 FT. SEE SHEET C5.1 FOR INSTALLATION DETAILS.
- CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREE ROOTS. IF ADDITIONAL TREES NEED TO BE IMPACTED FOR REMEDIATION ACTIVITIES CONTACT ENGINEER IMMEDIATELY.

EROSION CONTROL SEED		
SEED	BY % MASS	% GERMINATION (MIN)
WINTER RYE 80 (MIN)	80 (MIN)	85
RED FESCUE (CREEPING)	4 (MIN)	80
PERENNIAL GRASS	3 (MIN)	90
RED CLOVER	3 (MIN)	90
OTHER CROP GRASS	0.5 (MAX)	
NOXIOUS WEED SEED	0.5 (MAX)	
INERT MATTER	1.0 (MAX)	

PERMANENT SEED MIX		
SEED	BY % MASS	% GERMINATION (MIN)
RED FESCUE (CREEPING)	50	85
KENTUCKY BLUE	25	85
PERENNIAL RYE GRASS	10	90
RED TOP	10	85
LANDINO CLOVER	5	85



Wilcox & Barton INC.
CIVIL • ENVIRONMENTAL • GEOTECHNICAL

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CONCORD, NH 03301
603-369-4190
www.wilcoxandbarton.com

REVISION HISTORY
1. RESPONSE TO CONSERVATION COMMISSION COMMENTS
(04/24/2020)

Permitting

ALL DOCUMENTS PREPARED BY WILCOX & BARTON, INC. ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY WILCOX & BARTON, INC. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO WILCOX & BARTON, INC. OWNER SHALL INDEMNIFY AND HOLD HARMLESS WILCOX & BARTON, INC. FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

P&D REALTY

109 REFLECTION DR
SANDWICH, MA

D'AGOSTINO'S DELICATESSEN

1297 MASS. AVE.
ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Site Plan

Scale: 1" = 20'

Date: 03/04/2020

Drafted By: RSR | Checked By: DLF | Project Mgr: RWB | Project Number: PDRE0001

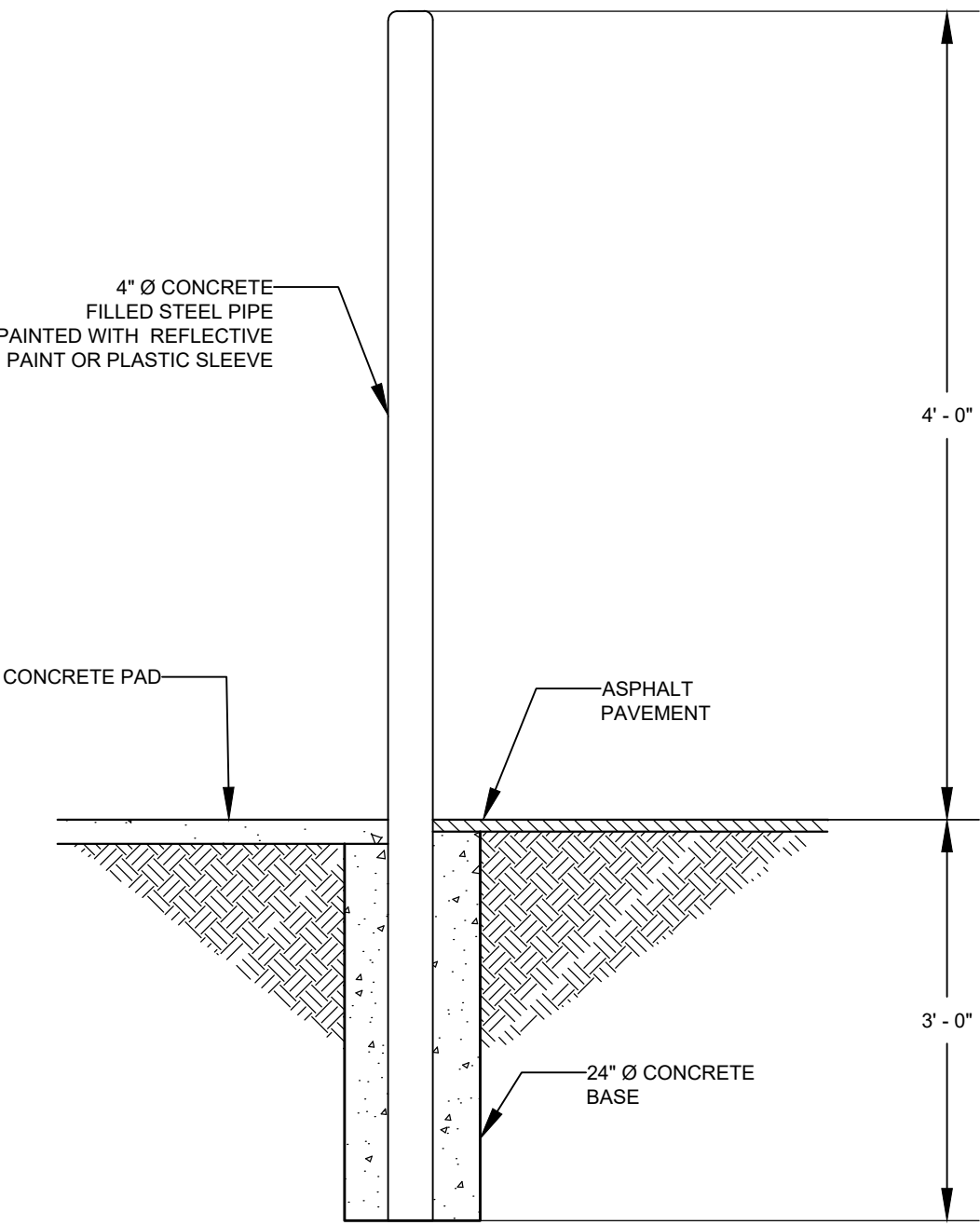
Sheet Number

MASSACHUSETTS PROFESSIONAL ENGINEER

DAVID L. FROTHINGHAM III
MA P.E. #53592

C1.1

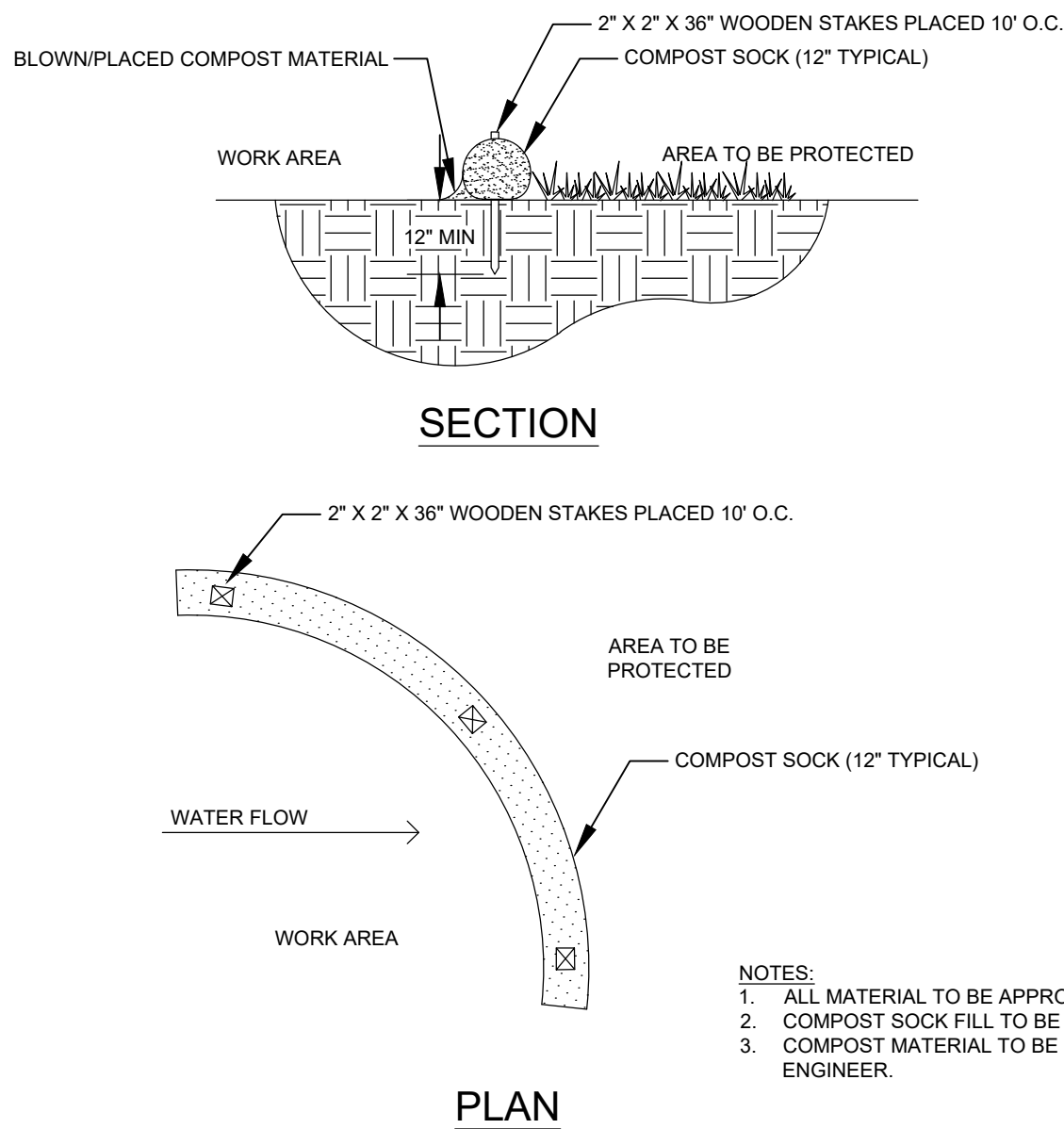
1 of 2



NOTES:
1. A PRECAST BOLLARD WHICH MEETS THE SPECIFIED DIMENSIONS MAY ALSO BE USED.

TRAFFIC BOLLARD

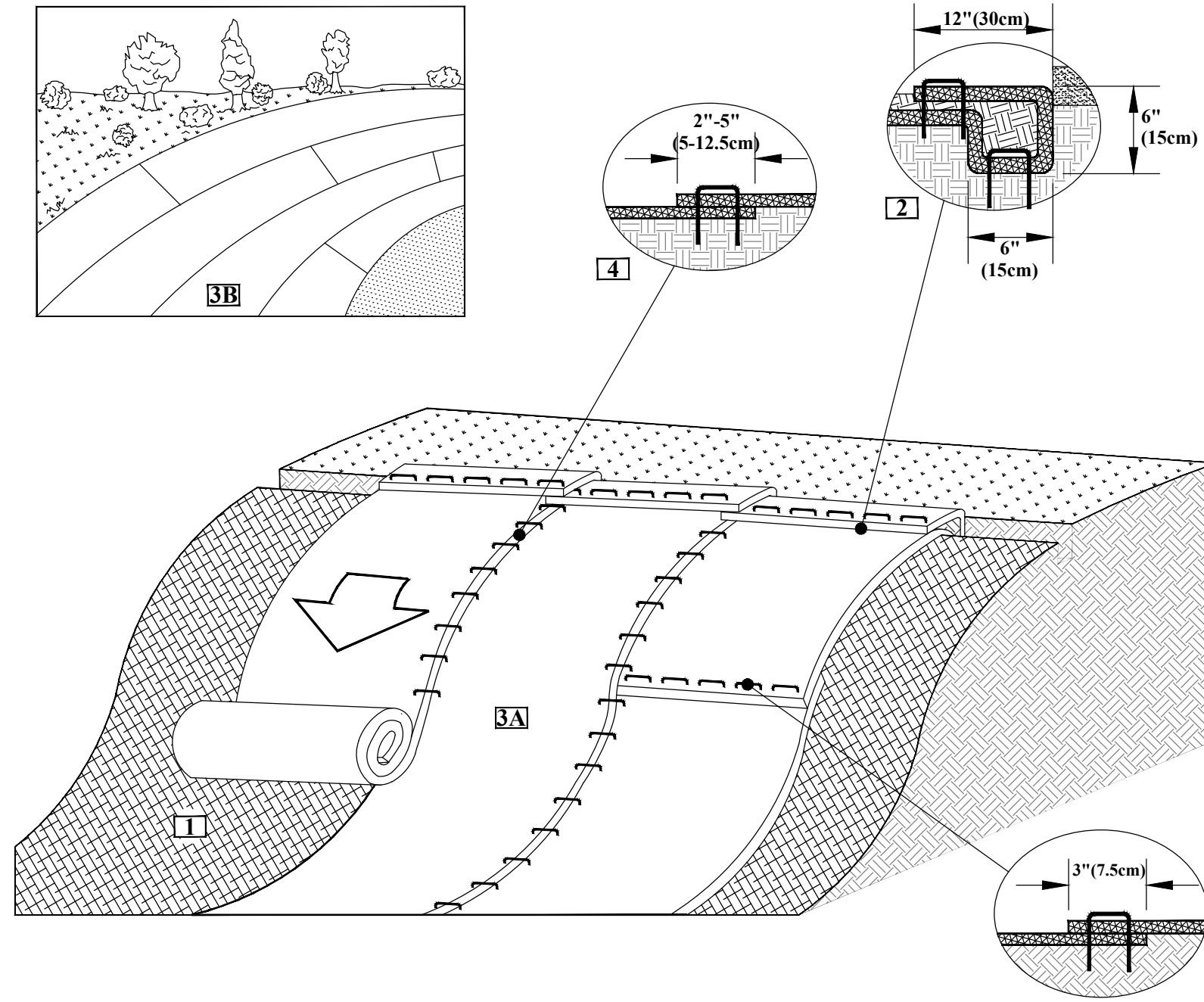
SOURCE: WILCOX & BARTON, INC.
NOT TO SCALE



NOTES:
1. ALL MATERIAL TO BE APPROVED BY ENGINEER.
2. COMPOST SOCK FILL TO BE APPROVED BY ENGINEER.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST SOCK SEDIMENT CONTROL

NOT TO SCALE



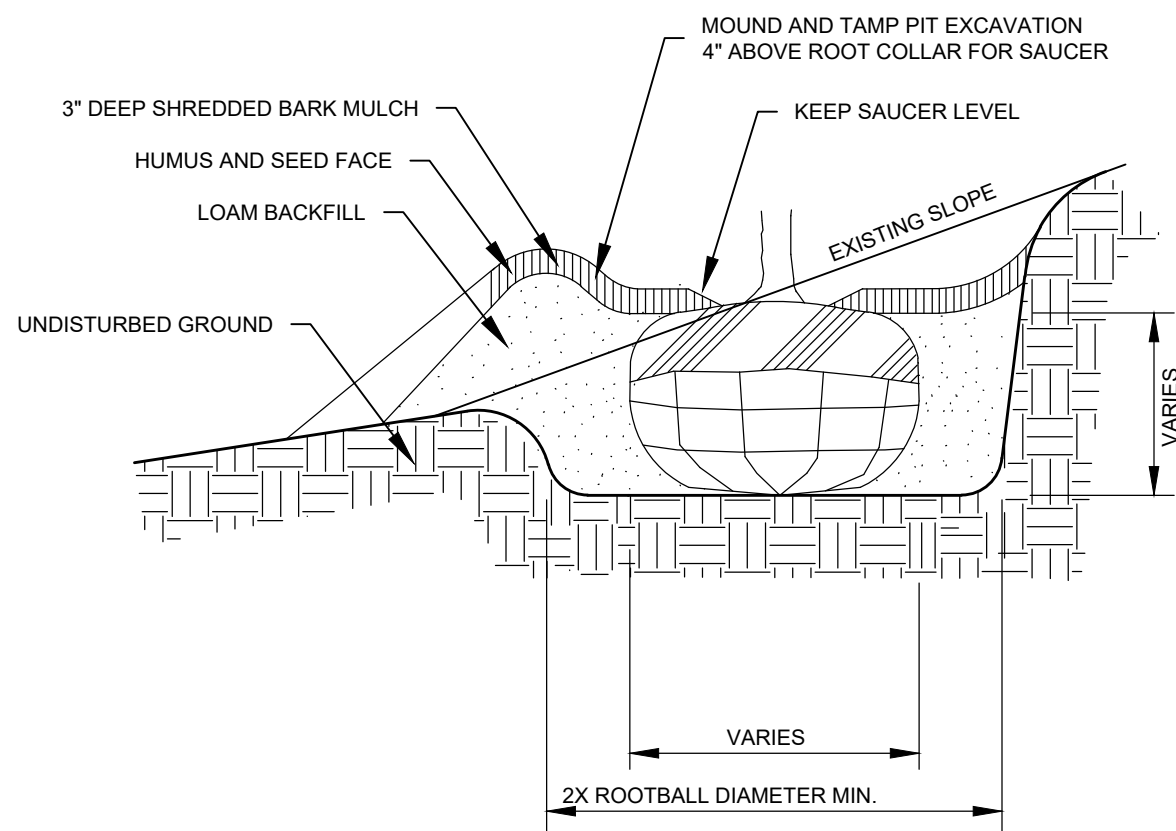
SLOPE INSTALLATION DETAIL

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12"(30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3"(7.5cm) overlap. Staple through overlapped area, approximately 12"(30cm) apart across entire RECPs width.

*NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

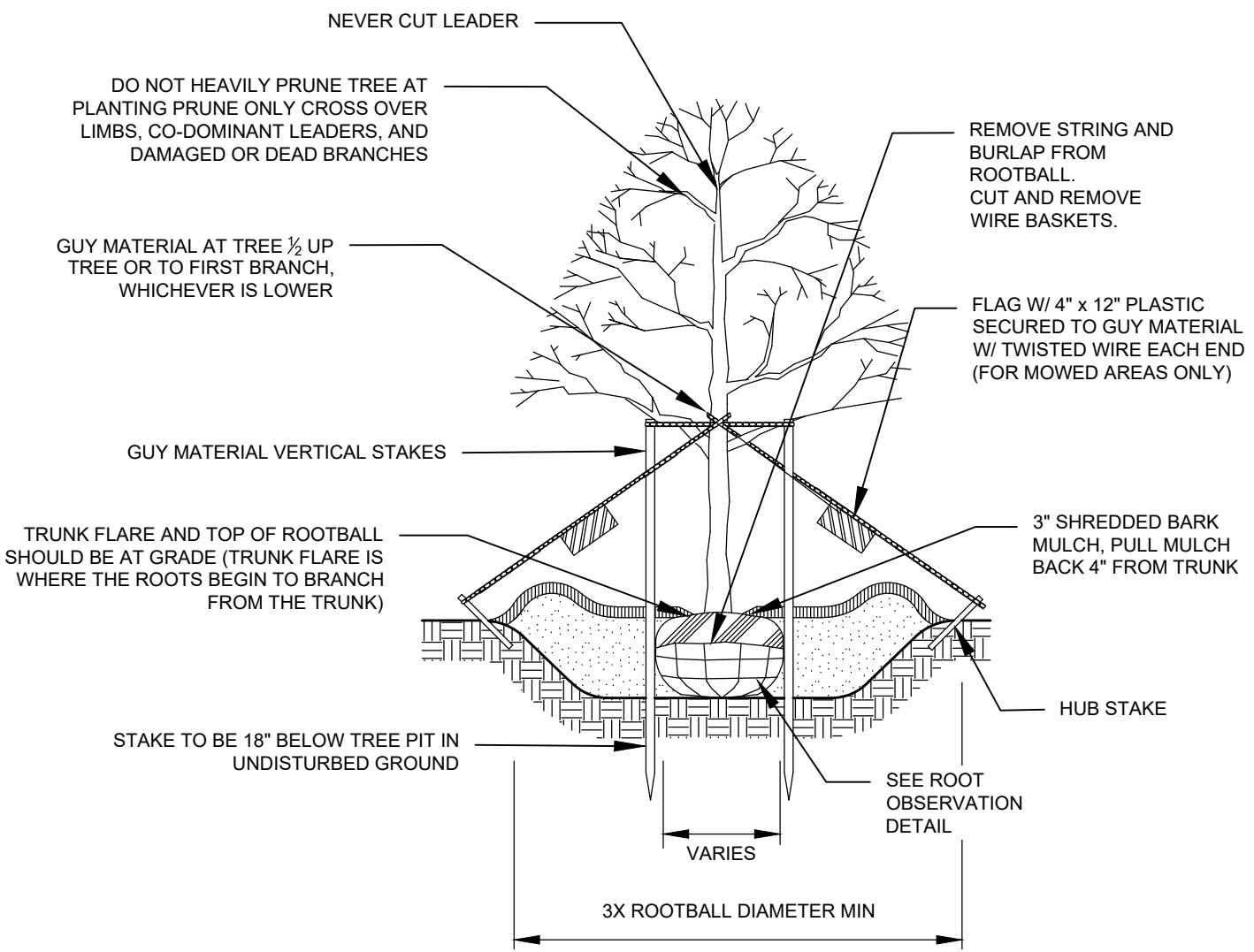
EROSION BLANKET SLOPE INSTALLTION

NOT TO SCALE



TYPICAL PLANTING PIT ON SLOPE 4:1 OR GREATER

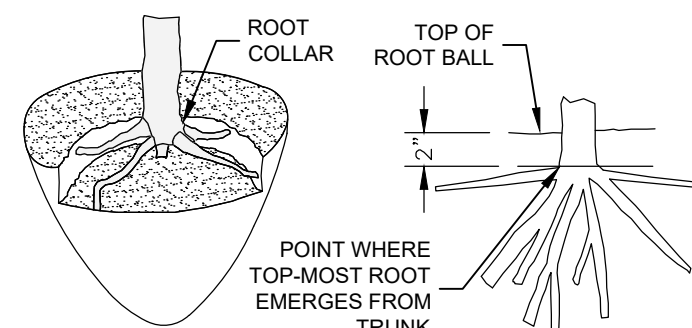
NOT TO SCALE



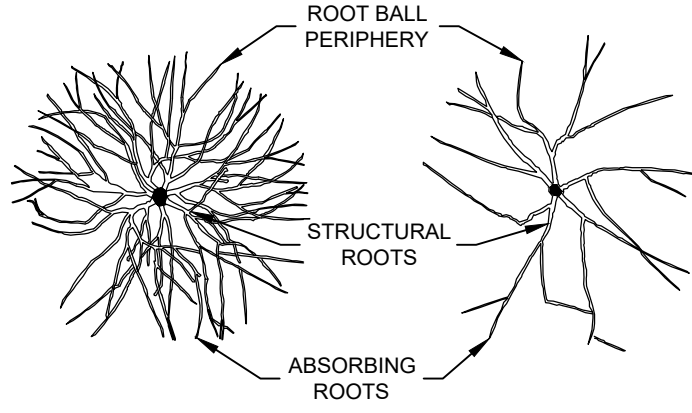
NOTES:
1. LOCAL FIELD CONDITIONS AS WELL AS PLANT CHARACTERISTICS WILL DETERMINE THE NECESSITY OF GUYING AND STAKING.
2. TYPICALLY ONLY TREES WITH A 3" OR GREATER CALIPER NEED TO BE STAKED.
3. TREE SHALL BE SET PLUMB, AFTER SETTLEMENT.
4. ALL NURSERY TAGS, TAPE, AND SIMILAR MATERIALS SHALL BE REMOVED.

DECIDUOUS TREE PLANTING

NOT TO SCALE



THE POINT WHERE TOP-MOST ROOT(S) EMERGES FROM THE TRUNK (ROOT COLLAR) SHOULD BE WITHIN THE TOP 2' OF SUBSTRATE. THE ROOT COLLAR AND THE ROOT BALL INTERIOR SHOULD BE FREE OF DEFECTS INCLUDING CIRCLING, KINKED, ASCENDING, AND STEM GIRDLING ROOTS. STRUCTURAL ROOTS SHALL REACH THE PERIPHERY NEAR THE TOP OF THE ROOT BALL.

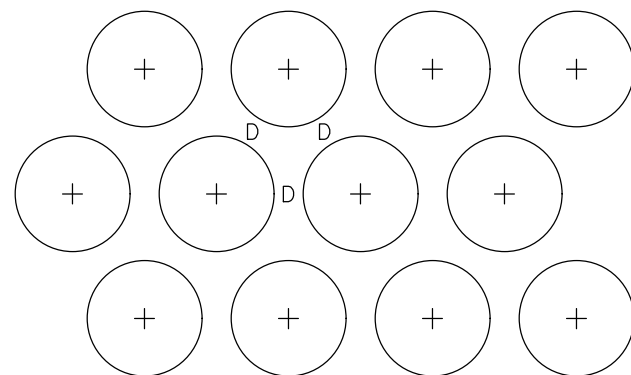


ACCEPTABLE

NOTES:
1. OBSERVATIONS OF ROOTS SHALL OCCUR PRIOR TO ACCEPTANCE. ROOTS AND SOIL MAY BE REMOVED DURING THE OBSERVATION PROCESS; SUBSTRATE/SOIL SHALL BE REPLACED AFTER THE OBSERVATIONS HAVE BEEN COMPLETED.

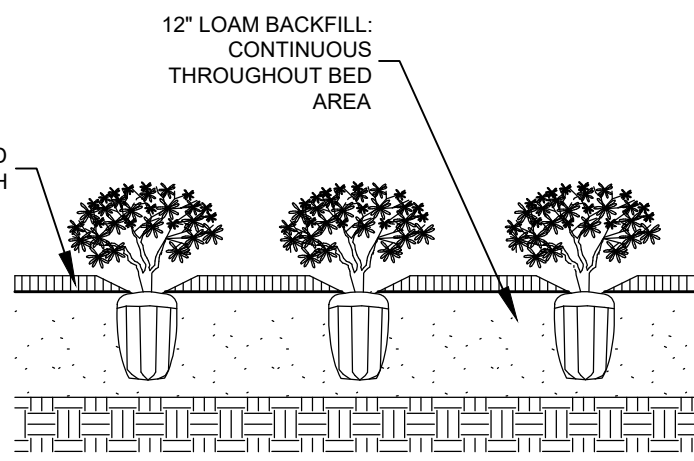
ROOT OBSERVATION

NOT TO SCALE



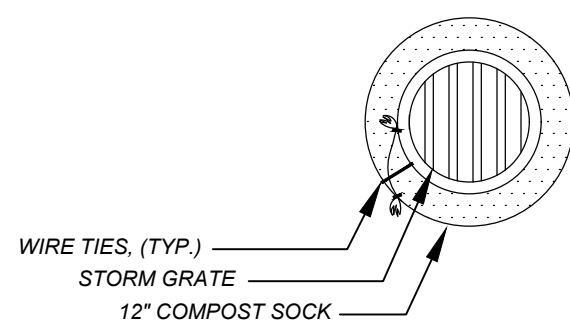
TYPICAL BED PLANT SPACING

D = DIMENSION OF PLANT SPACING (SHRUBS OR GROUND COVER AS INDICATED ON PLANS)

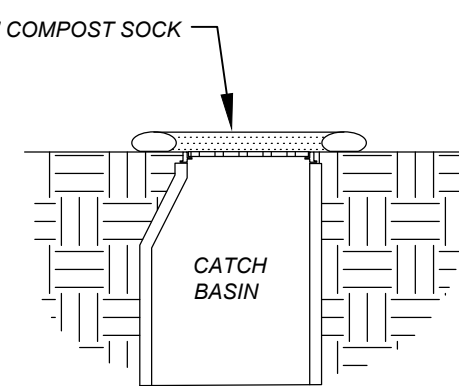


GROUND COVER BED PLANTING

NOT TO SCALE



DRAIN INLET PLAN

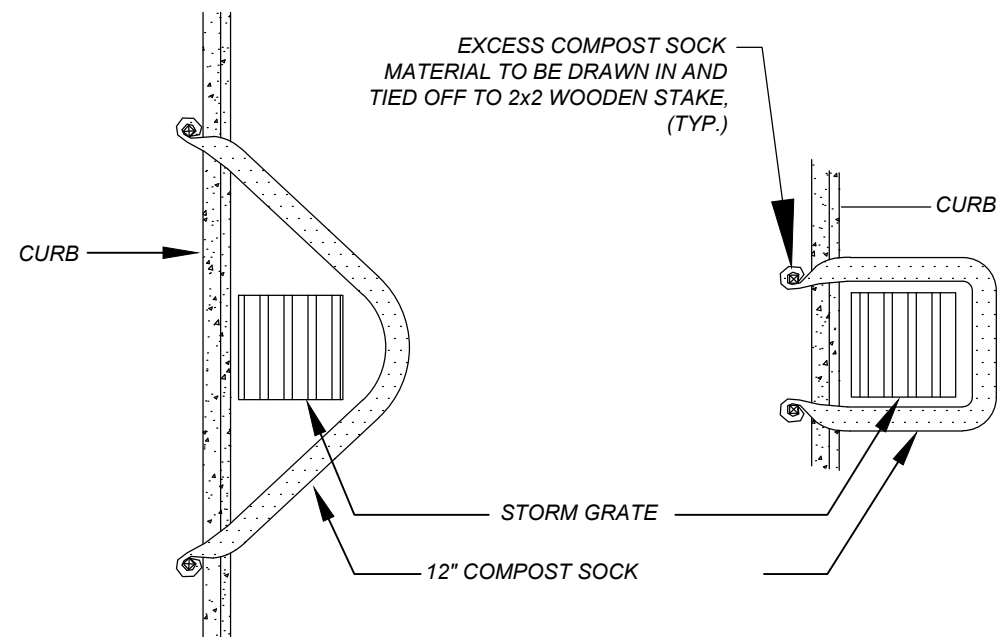


DRAIN INLET SECTION

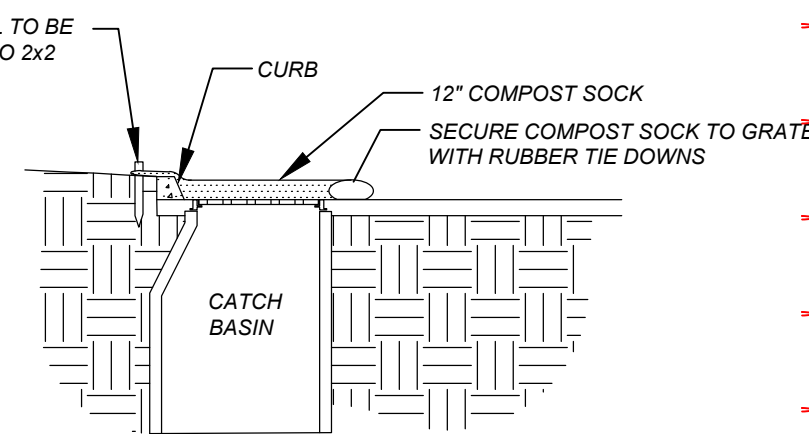
NOTES:
1. ALL MATERIAL TO BE APPROVED BY ENGINEER.
2. FILTER MEDIA SHALL BE A COURSE COMPOSTED MATERIAL APPROVED BY ENGINEER.
3. FILTER MEDIA TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST SOCK INLET PROTECTION

NOT TO SCALE



CURBSIDE OPTION "A" PLAN



CURBSIDE SECTION

REVISION HISTORY
1. RESPONSE TO CONSERVATION COMMISSION COMMENTS (04/24/2020)

Issued For

Permitting

ALL DOCUMENTS PREPARED BY WILCOX & BARTON, INC. ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY WILCOX & BARTON, INC. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO WILCOX & BARTON, INC. OWNER SHALL INDEMNIFY AND HOLD HARMLESS WILCOX & BARTON, INC. FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.

Owner

P&D REALTY

109 REFLECTION DR
SANDWICH, MA

Site

D'AGOSTINO'S DELICATESSEN

1297 MASS. AVE.
ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Construction & Erosion Control Details

Scale	N.T.S.	Date	03/04/2020
Drafted By	RSR	Checked By	DLF
Project Mgr	RWB	Project Number	PDRE0001

Sheet Number

C5.1

2 of 2

May 12, 2020

Emily Sullivan
Environmental Planner & Conservation Agent
Town of Arlington Conservation Commission
730 Massachusetts Avenue, Annex
Arlington, Massachusetts 02476

**RE: Response to Conservation Commission Comments
D'Agostino's Delicatessen
1297 Massachusetts Avenue, Arlington, MA**

Dear Ms. Sullivan,

Wilcox & Barton, Inc. is pleased to submit this letter addressing the comments provided in the Conservation Commission public hearing held on May 7, 2020. Enclosed please find electronic copies of the revised site plans, weekly inspection record form for the subject property, spill response kit inventory list, and PIG Spill Kit278 specifications. The project plans and inspection form have been revised as follows:

Commission Comments dated May 7, 2020

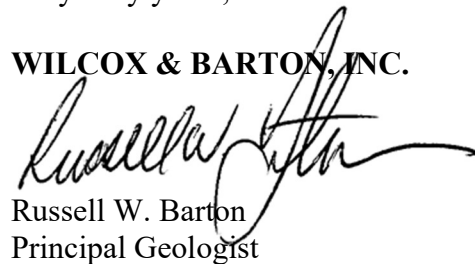
1. The Compost Sock Sediment Control installation detail specifies stakes shall be set on the side of the compost socks in the proposed area to be protected instead of through the center of the socks. See sheet C5.1.
2. We have evaluated the use of Cinnamon Ferns (*Osmundastrum Cinnamomeum*) for the proposed shrub plantings in-place of the proposed Sweet Ferns (*Comptonia Peregrina*). Of the two ferns, the Sweet Fern is more suitable for the proposed excavation area. Cinnamon ferns are a type of wetland plant (indicator code FACW), which require soils with a high moisture content or regular saturation during growing seasons. The proposed excavation area is an upland area 5 feet to 11 feet above the seasonal high-water line of Mill Brook. The area most likely consists of some granular fill material from previous land development and is on a bank with slopes of 2:1 and greater. Given these characteristics, the proposed excavation area soils likely do not contain the characteristics ideal for wetland classified plants. Sweet Ferns are not a wetland plant, requiring less water and may be established in drier soils. Furthermore, the current habitat of the proposed excavation area is more accurately describable as a man-made or disturbed habitat, which is more suitable for Sweet Ferns, and not a wetland area ideal for Cinnamon Ferns and like plants. To best stabilize disturbed areas in post construction, we recommend using Sweet Ferns as proposed shrub plantings. See sheet C1.1.
3. A spill kit shall be maintained at the site so that, in the event of a spill, clean-up materials are readily available. See attached Spill Response Kit Inventory List.

4. The following items have been added to the Weekly Inspection Record Form.
- Scheduled pump out date added to “Container due to be pumped out” reference under General.
 - Foot note added to notify Conservation Commission with phone number in the event of a spill.
 - Foot note added that weekly log records shall be maintained on site for a period of three years and that logs shall be available to Conservation Commission upon request.

If you have any questions, or require additional information, please contact me at (603) 369-4190 x502.

Very truly yours,

WILCOX & BARTON, INC.



Russell W. Barton
Principal Geologist

Attachments: Revised Site Plan Sheets
 - C1.1 Site Plan
 - C5.1 Construction & Erosion Control Details
 Weekly Inspection Record Form
 Spill Response Kit Inventory List
 PIG Spill Kit278 Specifications

WEEKLY INSPECTION RECORD

D'Agostino's Delicatessen - Used Vegetable Oil Storage Container
1297 Massachusetts Avenue
Arlington, Massachusetts 02476

Current Inspection Date _____

Inspector: _____

Previous Inspection Date _____

Note: NA = not applicable

Previous Action Issues Addressed: YES _____ NO _____

Include any required action items in comments.

Storage Container Name
<u>Storage Area Containment</u>
Container free of rust, weeps, wet spots, or excessive dents
Area around container free from debris
Container free from threats of snow or ice
Container in proper position
Container openings properly sealed
Is container accessible
Oil staining below lid or on tank exterior
Percentage full upon inspection

Grease Container		
YES	NO	NA
_____ %		

*Container to be emptied when 90% full.

GENERAL
Container lid locked
Container due to be pumped out
Other: _____

YES	NO	NA
Date: _____		

Inspector's Signature _____

Date _____

Comments: _____

Page _____

Scheduled container replacement date is 2030.

In the event of a spill, please notify Arlington Conservation Commission at (781) 316-3012.

Weekly log records shall be maintained on site for a period of 3 years, and shall be available to the Arlington Conservation Commission upon request.

SPILL RESPONSE KIT INVENTORY LIST
D'Agostino's Delicatessen
1297 Massachusetts Avenue
Arlington, Massachusetts

The following items are provided in the on-site oil spill response kit or are staged within the operating area of the site. Spill response materials are to be well-marked and kept in a readily accessible location that is known to staff. Staff must be familiar with the location and contents of the spill kit(s).

Spill response materials at this facility include:

Quantity	Units	Item
1	ea	Container to hold contents of spill kit and contaminated materials
1	bags	Loose absorbents for oil (e.g., Speedi-Dry)
4	bales	Absorbent socks/pads/wipes/pillows
1	box	Nitrile/latex gloves
1	ea	Dedicated shovel
1	ea	Dedicated push broom
2	ea	Plastic disposable bags

Verify quantity on-hand during a monthly inspection. Immediately replace any missing items.

PIG® Spill Kit in See-Thru Container

KIT278 Absorbs up to 12 gal., Absorbs Oils, Coolants, Solvents, Water – Universal

Roll your absorbents right to the spill with this wheeled mobile rapid-response, see-through spill kit.

- Durable polypropylene container with snap-tight lid protects absorbents from dirt and moisture
- Equipped with 1.5" casters for easy rolling over smooth surfaces
- PIG Blue Socks stop spreading spills; PIG Mat and Pillows absorb quickly; PIG Lite-Dri Loose Absorbent speeds final cleanup on rough surfaces or crevices
- Prepacked container provides easy access to contents
- Temporary disposal bags help make cleanup easier
- Small footprint is ideal for storage closets and other tight spaces
- Only PIG Spill Kits feature PIG Absorbents proven for rapid response
- For information on custom spill kits, just call 1-800-HOT-HOGS (468-4647)
- Spill Kit dimensions are approximate



Specifications

Wheels Included	Yes
Container Type	Can
Fluid Absorbed	Oils, Coolants, Solvents, Water – Universal
Color	Clear
Dimensions	14.8125" W x 19.3125" L x 23.6875" H
Absorbency	Up to 12 gal.
Brand	PIG
High Visibility	No
See-Through	Yes
Sold as	1 each
Weight	23 lbs.
# per Pallet	12394 of 637
Composition	Container - Polypropylene

	Mats - Polypropylene Socks Skin, Pillow Skin - Polypropylene Sock Filler - Magnesium Aluminosilicate Pillows Filler - Recycled Cellulose
--	---

Includes

- 4 - ext. dia. 3" x 48" L PIG® Blue Absorbent Sock (4048)
- 25 - 15" W x 20" L PIG® Absorbent Mat Pad (MAT203)
- 2 - 10" W x 10" L x 2" H PIG® Absorbent Pillow (PIL204)
- 1 - PIG® Lite-Dri® Loose Absorbent (PLP218)
- 2 - 18" W x 30" H Polyethylene Disposal Bags (BAG201-S)
- 1 - Clear Container

UNSPSC	47131905
--------	----------

UV Resistant	No
--------------	----

Wheels	(4) 1.5" Plastic Swivel Wheels
--------	--------------------------------

Pigalog® Page Number Page 100

Metric Equivalent

Absorbency	Up to 45.4 L
Dimensions	37.6cm W x 49.1cm L x 60.2cm H
Weight	10.4 kg

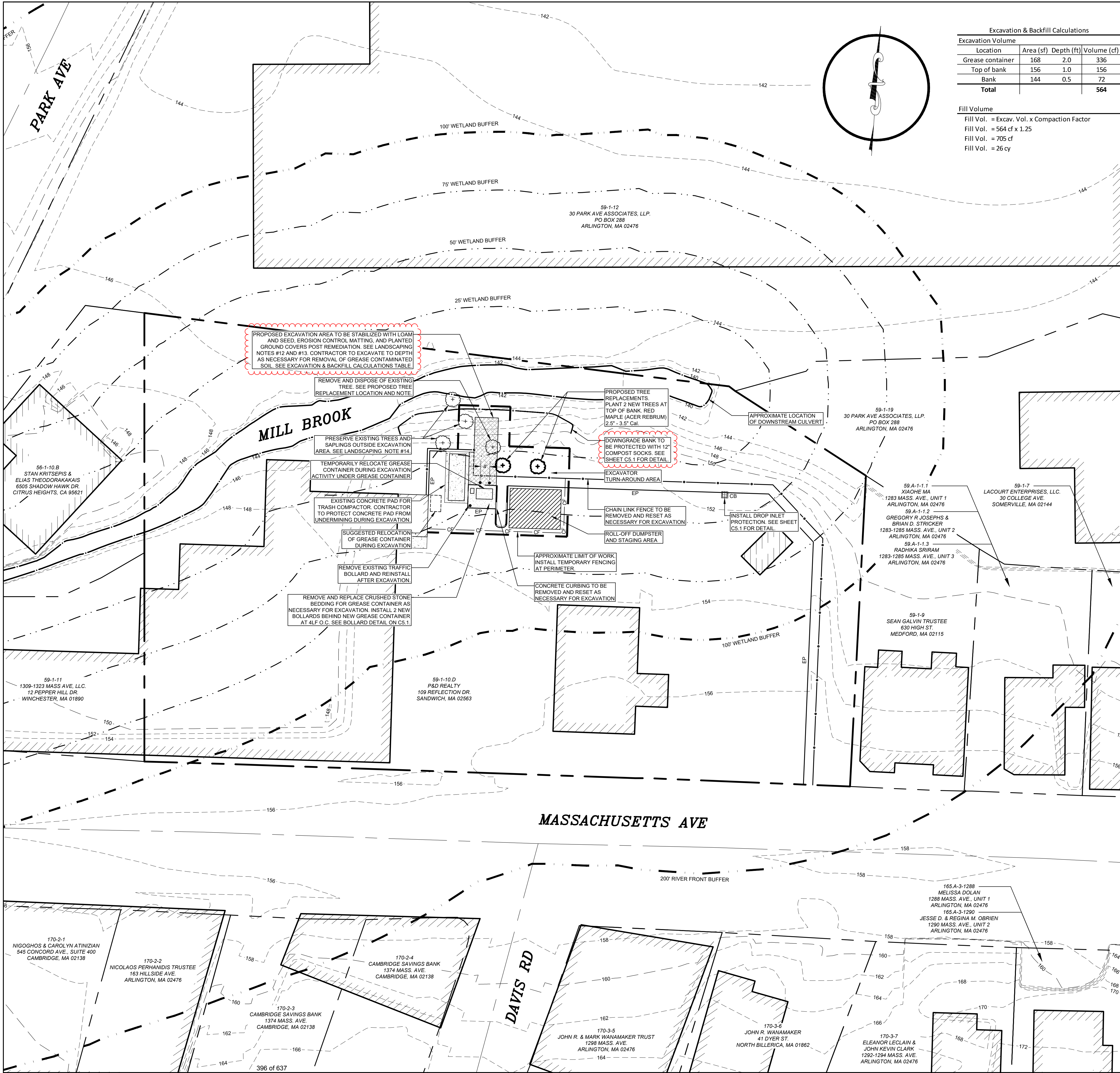
Technical Information

Technical Documents

- PIG Spill Kits
- PIG Universal Absorbent Mats
- Instructions for PIG Spill Kits
- PIG® LITE-DRI® Loose Absorbent
- PIG® Universal Absorbents
- BLUE PIG® Absorbents
- SUPER PIG® & PIG® Pillow absorbents
- 40 CFR 112.7
- 40 CFR 122.26



One Pork Avenue • Tipton, PA 16684-0304
 1-855-493-4647 • Fax: 1-800-621-7447 • newpig.com • hothogs@newpig.com



Excavation & Backfill Calculations			
Excavation Volume			
Location	Area (sf)	Depth (ft)	Volume (cf)
Grease container	168	2.0	336
Top of bank	156	1.0	156
Bank	144	0.5	72
Total			564

Fill Volume
Fill Vol. = Excav. Vol. x Compaction Factor
Fill Vol. = 564 cf x 1.25
Fill Vol. = 705 cf
Fill Vol. = 26 cy

LEGEND	
	PROPERTY LINE
	ABUTTER'S PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	BUILDINGS
	ROADWAY CENTERLINE
	EDGE OF PAVEMENT
	CURB
	CONCRETE PAD
	CHAIN LINK FENCE
	EDGE OF WETLAND/WATERWAY
	200' RIVERFRONT BUFFER
	100' WETLAND/WATERWAY BUFFER
	WETLAND/WATERWAY BUFFER
	TEMPORARY FENCE
	COMPOST SOCKS
	LIMIT OF WORK
	CATCH BASINS
	INLET PROTECTION
	DECIDUOUS TREES

GENERAL NOTES:

- EXISTING CONDITIONS, NORTH ORIENTATION, AND COORDINATE VALUES DEPICTED ON THESE DRAWINGS ARE BASED ON DATA COLLECTED AND PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES. 1.1. STRUCTURES LAYER UPDATED AUGUST 2019 1.2. TAX PARCELS LAYER UPDATED JANUARY 2020 1.3. ROAD CENTER LINES LAYER UPDATED NOVEMBER 2018

- TOPOGRAPHICAL INFORMATION PROVIDED BY THE TOWN OF ARLINGTON, MA GIS DATA "2-FOOT ELEVATION CONTOURS" DATED 2018.

- CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF WALLS AND/OR SHORING OF EXCAVATIONS DURING CONSTRUCTION.

- THE CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS AND SUBMITTALS BEFORE SUBMISSION TO THE ENGINEER. THUS, PROVIDING ANY INFORMATION REQUIRED OF THE FABRICATOR SUCH AS FIELD DIMENSIONS, ELEVATIONS, ETC. OTHERWISE THE SHOP DRAWINGS OR SUBMITTALS WILL BE REJECTED UNTIL SUCH INFORMATION IS FURNISHED BY THE CONTRACTOR.

- BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT. ASTM D1557.

- THE CONTRACTOR SHALL CONTACT DIG-SAFE (1-888-DIG-SAFE) AT LEAST 48 HOURS AND LESS THAN 30 DAYS PRIOR TO STARTING CONSTRUCTION AND SHALL VERIFY ALL UTILITY LOCATIONS IN THE FIELD.

- CONTRACTOR WILL NOTIFY ENGINEERS IMMEDIATELY IF SITE CONDITIONS DIFFER FROM WHAT IS SHOWN ON PLAN.

LANDSCAPING NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH PLANTING OPERATIONS

- LANDSCAPING CONTRACTOR SHALL RECEIVE SITE GRADE TO +/- 0.10 FOOT.

- ALL PLANT MATERIALS AND FINAL LOCATION OF ALL PLANT MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION

- IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR SHALL CONTACT OWNER'S REPRESENTATIVE FOR IMMEDIATE RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE OWNER'S REPRESENTATIVE WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE THE MATERIALS.

- CONTRACTOR SHALL FURNISH PLANT MATERIALS FREE OF PESTS OR PLANT DISEASES. PRE-SELECTED OR "TAGGED" MATERIAL MUST BE INSPECTED BY THE CONTRACTOR AND CERTIFIED AS PEST AND DISEASE FREE. IT IS THE CONTRACTOR'S OBLIGATION TO WARRANTY ALL PLANT MATERIALS.

- ALL GROUND COVERS SHALL BE TRIANGULARLY SPACED UNLESS OTHERWISE NOTED.

- CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY EXISTING MATERIALS DAMAGED DURING PLANTING OPERATIONS.

- ALL LANDSCAPE AREAS SHALL BE COVERED WITH 2-INCHES OF ORGANIC BARK MULCH UNLESS OTHERWISE NOTED.

- AREAS SHOWN AS GROUND COVER AT THE BASE OF TREE AND SHRUB MATERIALS MUST CONFORM TO THE FOLLOWING CRITERIA. THERE SHALL BE NO GROUND COVER PLANT MATERIAL AT THE BASE OF THE TREE OR SHRUB AS FOLLOWS: A) 4-FOOT RADIUS AROUND EVERGREEN TREES, B) 3-FOOT RADIUS AROUND DECIDUOUS TREES, AND C) 2-FOOT RADIUS AROUND LARGE SHRUBS.

- FINAL PLACEMENT OF ALL PLANT MATERIALS SHALL BE SUBJECT TO APPROVAL OF OWNER'S REPRESENTATIVE PRIOR TO FINAL PLACEMENT AND BACKFILL. CONTACT OWNER'S REPRESENTATIVE 24-HOURS PRIOR TO PLACEMENT FOR APPROVAL.

- ALL DISTURBED AREAS, UNLESS OTHERWISE NOTED, TO BE LOAM, SEEDED, AND MULCHED.

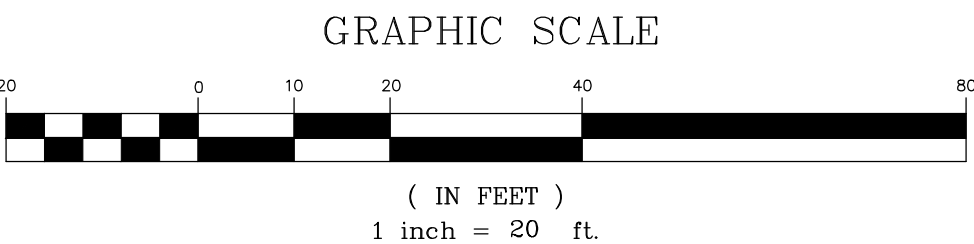
- CONTRACTOR TO USE NORTH AMERICAN GREEN BIONET SC150BN MATTING FOR ALL EROSION CONTROL MATTING. 70% STRAW / 30% COCONUT FIBER MATRIX.

- CONTRACTOR TO USE SWEET FERNS (COMPTONIA PEREGRINA) FOR ALL GROUND COVER PLANTINGS. SWEET FERNS SHALL BE PLANTED WITHIN THE EXCAVATION AREA NORTH OF THE EXISTING CHAIN LINK FENCE AND SPACED AT 2 FT TO 3 FT. SEE SHEET C5.1 FOR INSTALLATION DETAILS.

- CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREE ROOTS. IF ADDITIONAL TREES NEED TO BE IMPACTED FOR REMEDIATION ACTIVITIES CONTACT ENGINEER IMMEDIATELY.

EROSION CONTROL SEED		
SEED	BY % MASS	% GERMINATION (MIN)
WINTER RYE 80 (MIN)	80 (MIN)	85
RED FESCUE (CREEPING)	4 (MIN)	80
PERENNIAL GRASS	3 (MIN)	90
RED CLOVER	3 (MIN)	90
OTHER CROP GRASS	0.5 (MAX)	
NOXIOUS WEED SEED	0.5 (MAX)	
INERT MATTER	1.0 (MAX)	

PERMANENT SEED MIX		
SEED	BY % MASS	% GERMINATION (MIN)
RED FESCUE (CREEPING)	50	85
KENTUCKY BLUE	25	85
PERENNIAL RYE GRASS	10	90
RED TOP	10	85
LANDINO CLOVER	5	85



Wilcox & Barton INC.
CIVIL • ENVIRONMENTAL • GEOTECHNICAL

2 CAPITAL PLAZA, SUITE 305
CONCORD, NH 03301
603-369-4190
www.wilcoxandbarton.com

- REVISION HISTORY
- RESPONSE TO CONSERVATION COMMISSION COMMENTS (04/24/2020)
 - RESPONSE TO CONSERVATION COMMISSION COMMENTS (05/12/2020)

Permitting

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P&D REALTY

109 REFLECTION DR SANDWICH, MA

D'AGOSTINO'S DELICATESSEN

1297 MASS. AVE. ARLINGTON, MA

Map/Block/Lot: 59/1/10D

Drawing Title

Site Plan

Scale 1" = 20'

Date 03/04/2020

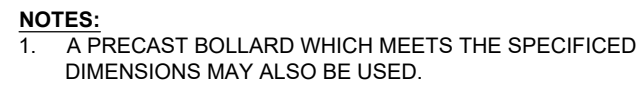
Drafted By RSR Checked By DLF Project Mgr RWB Project Number PDRE0001 Sheet Number

COMMONWEALTH OF MASSACHUSETTS
DAVID L. FROTHINGHAM III
REGISTERED PROFESSIONAL ENGINEER

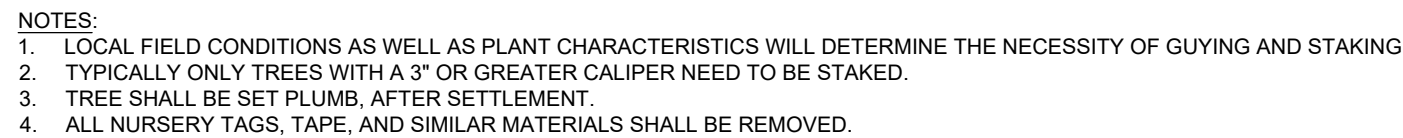
ENGINEER: DAVID L. FROTHINGHAM III
MA P.E. #53592

C1.1

1 of 2



SOURCE: WILCOX & BARTON, INC
NOT TO SCALE



NOT TO SCALE



NOT TO SCALE



NOT TO SCALE



NOT TO SCALE



Town of Arlington, Massachusetts

Deliberation: Notice of Intent: 105 Lafayette Street

Summary:

MassDEP File #091-0322

This Notice of Intent (NOI) was presented to the Commission during its 05/07/2020 meeting. It is strongly encouraged that members of the public submit written comment for this NOI to the Conservation Agent in advance of the hearing, by emailing Emily Sullivan at esullivan@town.arlington.ma.us. All materials submitted for this NOI can be found on the Commission's agenda and minutes page, under the agenda for the 05/21/2020 meeting.

Hearing Summary:

This project proposes to raze and construct a single family home within the 100-ft Wetlands Buffer, 200-ft Riverfront Area, and floodplain.

ATTACHMENTS:

Type	File Name	Description
▢ Notice of Intent	105_Lafayette_NOI.pdf	105 Lafayette St NOI Packet
▢ Notice of Intent	105_Lafayette_Plans.pdf	105 Lafayette St Plans
▢ Notice of Intent	105_Lafayette_Engineering_Drainage_Calculations.pdf	105 Lafayette St Drainage Calculations
▢ Order of Conditions	05162020_Draft_105_Lafayette_Findings_and_Special_Conditions.pdf	Draft 105 Lafayette St OOC
▢ Notice of Intent	105_Lafayette_Revised_Plan.pdf	105 Lafayette St Revised Plans
▢ Notice of Intent	105_Lafayette_Revised_Plan_Detail.pdf	105 Lafayette St Revised Plan Details
▢ Notice of Intent	105_Lafayette_Revised_Engineering_Drainage_Calculations.pdf	105 Lafayette St Revised Drainage Calculations

Notice of Intent Application and Wetland Resource Area Analysis

April 20, 2020

Subject Property

105 Lafayette Street

Parcel ID: 2-5-14

Arlington, Massachusetts

Applicant and Property Owner

Lori Philbin

105 Lafayette Street

Arlington, MA 02474

LEC Environmental Consultants, Inc.

380 Lowell Street

Suite 101

Wakefield, MA 01880

781-245-2500

www.lecenvironmental.com

April 20, 2020

Federal Express

Arlington Conservation Commission
Arlington Town Hall Annex
730 Massachusetts Avenue
Arlington, MA 02476

**Re: Notice of Intent Application and
Wetland Resource Area Analysis
105 Lafayette Street
Parcel ID: 2-5-14
Arlington, Massachusetts**

[LEC File #: Phil\11-166.02]

Dear Members of the Conservation Commission:

On behalf of the Applicant and Property Owner, Lori Philbin, LEC Environmental Consultants, Inc., (LEC) is filing the enclosed Notice of Intent (NOI) Application and *Wetland Resource Area Analysis* with the Arlington Conservation Commission to raze and rebuild an existing single-family dwelling and associated site appurtenances at 105 Lafayette Street in Arlington, Massachusetts. Portions of the proposed activities are located within the 100-foot Buffer Zone to Bordering Vegetated Wetlands (BVW) and the outer portion of the 200-foot Riverfront Area associated with Alewife Brook/Little River, and within Bordering Land Subject to Flooding (BLSF). The Applicant proposes to implement erosion controls, and provide compensatory flood storage and stormwater management to minimize the potential for impacts to the resource areas and improve existing site conditions.

LEC was retained to identify Wetland Resource Areas protectable under the *Massachusetts Wetlands Protection Act* (M.G.L. c. 131, s. 40, the *Act*), its implementing Regulations (310 CMR 10.00, the *Act Regulations*), the *Town of Arlington Wetlands Protection Bylaw* (Article 8, the *Bylaw*) and its implementing *Wetlands Protection Regulations* (March 1, 2018, the *Bylaw Regulations*), and to prepare this NOI Application. Gala Simon Associates, Inc., has prepared the enclosed *Grading/Drainage Plan - 105 Lafayette Street, Arlington, Massachusetts*, and *Details Plan*, both dated May 27, 2012 and revised through March 26, 2020 showing the existing and proposed site conditions and construction details (Appendix B). Details of the stormwater design, supporting calculations, and an *Operation & Maintenance Plan* can be found in the *Engineering Drainage Calculations for 105 Lafayette Street, Arlington, Massachusetts*, also prepared by Gala Simon Associates, Inc., and dated March 26, 2020 (*Drainage Calculations*, attached).

LEC Environmental Consultants, Inc.

www.lecenvironmental.com

12 Resnik Road
Suite 1
Plymouth, MA 02360
508-746-9491
508-746-9492 (Fax)

PLYMOUTH, MA

380 Lowell Street
Suite 101
Wakefield, MA 01880
781-245-2500
781-245-6677 (Fax)

WAKEFIELD, MA

100 Grove Street
Suite 302
Worcester, MA 01605
508-753-3077
508-753-3177 (Fax)

WORCESTER, MA

P. O. Box 590
Rindge, NH 03461
603-899-4000
603-899-6726 (Fax)

RINDGE, NH



Enclosed please find two checks made payable to the Town of Arlington in the amounts of Three Hundred, Eighty-Seven Dollars and Fifty Cents (\$387.50) and Six Hundred Dollars (\$600.00) for the purpose of filing this Application under State and Local guidelines, respectively. The check payable to the Commonwealth of Massachusetts in the amount of Three Hundred, Sixty-Two Dollars and Fifty Cents (\$362.50) has been mailed to the DEP Lockbox with a copy of the NOI Wetland Fee Transmittal Form.

Thank you for your consideration of this Application. We look forward to meeting with you at the May 7, 2020 Public Hearing. Should you have any questions, please do not hesitate to contact me in our Wakefield office at 781-245-2500 or at rkirby@lecenvironmental.com.

Sincerely,

LEC Environmental Consultants, Inc.

A handwritten signature in black ink, appearing to read "Richard A. Kirby", with a long horizontal flourish extending to the right.

Richard A. Kirby
Senior Wetland Scientist

cc: DEP, Northeast Region
Loir Philbin
Gala Simon Associates, Inc.

rak: projects\11-166.02\NOIReport.doc

i.	WPA Form 3 – Notice of Intent
ii.	WPA Appendix B – Wetland Fee Transmittal Form
iii.	Local Filing Fee Form
iv.	Legal Charge Authorization Form
v.	Affidavit of Service
vi.	Letter to Abutters
vii.	Abutter Notification Form
viii.	Certified List of Abutters

Wetland Resource Area Analysis and Report

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Literature Cited

Appendix A

Locus Maps

Figure 1: USGS Topographic Quadrangle

Figure 2: FEMA Flood Insurance Rate Map

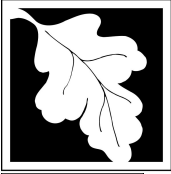
Figure 3: MassGIS Orthophoto & NHESP Estimated Habitat Map

Appendix B

Grading/Drainage Plan - 105 Lafayette Street, Arlington, Massachusetts, dated May 27, 2012 and revised through March 26, 2020, prepared by Gala Simon Associates, Inc.

Attachment

Engineering Drainage Calculations for 105 Lafayette Street, Arlington, Massachusetts, dated March 26, 2020, prepared by Gala Simon Associates, Inc.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
Town of Arlington Wetlands Protection Bylaw (Article 8)

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

105 Lafayette Street

a. Street Address

Arlington

b. City/Town

02474

c. Zip Code

Latitude and Longitude:

42.399096 N

d. Latitude

-71.142184 W

e. Longitude

Parcel ID: 2-5-14

f. Assessors Map/Plat Number

g. Parcel /Lot Number

2. Applicant:

Lori

a. First Name

Philbin

b. Last Name

N/A

c. Organization

105 Lafayette Street

d. Street Address

Arlington

e. City/Town

MA

f. State

02474

g. Zip Code

781-646-4101

h. Phone Number

N/A

i. Fax Number

lori.philbin@verizon.net

j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

Same as Applicant

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Richard

a. First Name

Kirby

b. Last Name

LEC Environmental Consultants, Inc.

c. Company

380 Lowell Street, Suite 101

d. Street Address

Wakefield

e. City/Town

MA

f. State

01880

g. Zip Code

781-245-2500

h. Phone Number

781-245-6677

i. Fax Number

rkirby@lecenvironmental.com

j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

\$750.00

a. Total Fee Paid

\$362.50

b. State Fee Paid

\$387.50

c. City/Town Fee Paid



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
Town of Arlington Wetlands Protection Bylaw (Article 8)

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

A. General Information (continued)

6. General Project Description:

The Applicant proposes to raze and rebuild an existing single-family dwelling and associated site appurtenances at 105 Lafayette Street in Arlington, Massachusetts. Portions of the proposed activities are located within the 100-foot Buffer Zone to Bordering Vegetated Wetlands (BVW) and the outer portion of the 200-foot Riverfront Area associated with Alewife Brook, and within Bordering Land Subject to Flooding (BLSF). The Applicant proposes to implement erosion controls and stormwater management to minimize the potential for impacts to the resource areas and improve existing site conditions.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Commercial/Industrial | 4. <input type="checkbox"/> Dock/Pier |
| 5. <input type="checkbox"/> Utilities | 6. <input type="checkbox"/> Coastal engineering Structure |
| 7. <input type="checkbox"/> Agriculture (e.g., cranberries, forestry) | 8. <input type="checkbox"/> Transportation |
| 9. <input type="checkbox"/> Other | |

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR 10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Southern Middlesex

a. County

01227

c. Book

b. Certificate # (if registered land)

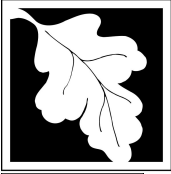
67

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



Massachusetts Department of Environmental Protection
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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Bank	1. linear feet	2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input checked="" type="checkbox"/> Bordering Land Subject to Flooding	475± 1. square feet 538± 3. cubic feet of flood storage lost	952± 2. square feet 2,856± 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	Alewife Brook (inland) 1. Name of Waterway (if available) - specify coastal or inland	

2. Width of Riverfront Area (check one):

- ☐ 25 ft. - Designated Densely Developed Areas only
- ☐ 100 ft. - New agricultural projects only
- ☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

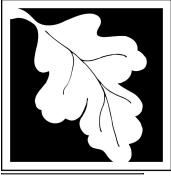
2,321±	0	816±
a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.

5. Has an alternatives analysis been done and is it attached to this NOI? ☒ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
Town of Arlington Wetlands Protection Bylaw (Article 8)

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MassDEP File Number

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City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

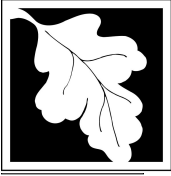
Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet _____ 2. cubic yards dredged _____	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet _____	2. cubic yards beach nourishment _____
e. <input type="checkbox"/> Coastal Dunes	1. square feet _____	2. cubic yards dune nourishment _____
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	1. linear feet _____	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet _____	
h. <input type="checkbox"/> Salt Marshes	1. square feet _____	2. sq ft restoration, rehab., creation _____
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet _____	
	2. cubic yards dredged _____	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet _____	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged _____	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	1. square feet _____	
4. <input type="checkbox"/> Restoration/Enhancement		
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.		
a. square feet of BVW _____	b. square feet of Salt Marsh _____	

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings _____

b. number of replacement stream crossings _____



Massachusetts Department of Environmental Protection
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Town of Arlington Wetlands Protection Bylaw (Article 8)

Provided by MassDEP:

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C. Other Applicable Standards and Requirements

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

2017

b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area

percentage/acreage

(b) outside Resource Area

percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
Town of Arlington Wetlands Protection Bylaw (Article 8)

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C. Other Applicable Standards and Requirements (cont'd)

- (c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/ mesa/ mesa_fee_schedule.htm).
Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

- (d) ☐ Vegetation cover type map of site
- (e) ☐ Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following
1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/ mesa/ mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)
 2. ☐ Separate MESA review ongoing. a. NHESP Tracking # _____ b. Date submitted to NHESP _____
 3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.
3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?
- a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

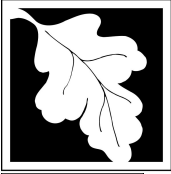
South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.



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Town of Arlington Wetlands Protection Bylaw (Article 8)

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users:

Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☐ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.
b. ☒ No. Check why the project is exempt:
1. ☒ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



Massachusetts Department of Environmental Protection
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WPA Form 3 – Notice of Intent

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Town of Arlington Wetlands Protection Bylaw (Article 8)

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MassDEP File Number

Document Transaction Number

Arlington

City/Town

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.
- Grading/Drainage Plan - 105 Lafayette Street, Arlington, Massachusetts
- | | |
|------------------------|--------------------------|
| a. Plan Title | AI Gala |
| b. Prepared By | c. Signed and Stamped by |
| March 26, 2020 | 1 inch = 10 feet |
| d. Final Revision Date | e. Scale |
- Engineering Drainage Calculations for 105 Lafayette Street, Arlington, Massachusetts by Gala Simon Associates, Inc.
- | | |
|--------------------------------------|----------------|
| f. Additional Plan or Document Title | March 26, 2020 |
| | g. Date |
5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☒ Attach NOI Wetland Fee Transmittal Form
9. ☒ Attach Stormwater Report, if needed (required under Bylaw).

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

134	3/17/2020
2. Municipal Check Number	3. Check date
135	3/17/2020
4. State Check Number	5. Check date
David A. & Lori A.	Philbin
6. Payor name on check: First Name	7. Payor name on check: Last Name



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Provided by MassDEP:

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
Town of Arlington Wetlands Protection Bylaw (Article 8)

MassDEP File Number

Document Transaction Number

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City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant

2. Date

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

3/17/2020

6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Town of Arlington Wetlands Protection Bylaw (Article 8)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

105 Lafayette Street

a. Street Address

135

c. Check number

Arlington

b. City/Town

\$362.50

d. Fee amount

2. Applicant Mailing Address:

Lori

a. First Name

N/A

c. Organization

105 Lafayette Street

d. Mailing Address

Arlington

e. City/Town

781-646-4101

h. Phone Number

N/A

i. Fax Number

Philbin

b. Last Name

MA

f. State

02474

g. Zip Code

lori.philbin@verizon.net

j. Email Address

3. Property Owner (if different):

Same as Applicant

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Cat 2a.) Construction of SFD	1.5 (RF Area)	\$500.00	\$750.00
Step 5/Total Project Fee:			\$750.00

Step 6/Fee Payments:

Total Project Fee:	<u>\$750.00</u>
	a. Total Fee from Step 5
State share of filing Fee:	<u>\$362.50</u>
	b. 1/2 Total Fee less \$12.50
City/Town share of filling Fee:	<u>\$387.50</u>
	c. 1/2 Total Fee plus \$12.50

C. Submittal Requirements

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Bylaw Filing Fees and Transmittal Form

Rules:

1. Fees are payable at the time of filing the application and are non-refundable.
2. Fees shall be calculated per schedule below.
3. Town, County, State, and Federal Projects are exempt from fees.
4. These fees are in addition to the fees paid under M.G.L. Ch. 131, s.40 (ACT).

Fee Schedule (ACC approved 1/8/15):

\$	No./Area	Category
		(R1) RDA - \$150 local fee, no state fee
		(N1) Minor Project - \$200 (house addition, tennis court, swimming pool, utility work, work in/on/or affecting any body of water, wetland or floodplain).
\$600.00	1	(N2) Single Family Dwelling - \$600
		(N3) Multiple Dwelling Structures - \$600 + \$100 per unit all or part of which lies within 100 feet of wetlands or within land subject to flooding.
		(N4) Commercial, Industrial, and Institutional Projects - \$800 + 50¢/s.f. wetland disturbed; 2¢/s.f. land subject to flooding or buffer zone disturbed.
		(N5) Subdivisions - \$600 + \$4/l.f. feet of roadway sideline within 100 ft. of wetlands or within land subject to flooding.
		(N6) Other Fees - copies, printouts; per public records law
		(N7) Minor Project Change - \$50
		(N8) Work on Docks, Piers, Revetments, Dikes, etc - \$4 per linear foot
		(N9) Resource Boundary Delineation (ANRAD) - \$1 per linear foot
		(N10) Certificate of Compliance (COC or PCOC) - No charge if before expiration of Order, \$200 if after that date.
		(N11) Amendments - \$300 or 50% of original local filing fee, whichever is less.
		(N12) Extensions -
		a. Single family dwelling or minor project - \$100.
		b. Other - \$150.
		(N13) Consultant Fee -per estimate from consultant
\$600.00	TOTAL	

Note: Submit this form along with the forms submitted for the ACT - the "Wetlands Filing Fee Calculations Worksheet," and the "Notice of Intent Fee Transmittal Form."

Legal Notice Charge Authorization

DATE:

TO: legals@wickedlocal.com

I hereby authorize Community Newspapers to bill me directly for the legal notice to be published in the Arlington Advocate newspaper on _____ for a public hearing with the Arlington Conservation Commission to review a project at the following location:

Thank you.

Signed: 

Send bill to:

Lori Philbin (Address)
105 Lafayette St.
Arlington MA 02474
781-646-4101 (Phone)

AFFIDAVIT OF SERVICE

Under the *Massachusetts Wetlands Protection Act*

and

the *Town of Arlington Wetlands Protection Bylaw*

I, Sharon A. Sullivan, on behalf of Lori Philbin, hereby certify under the pains and penalties of perjury that on April 20, 2020 I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 and 310 CMR 10.05 (4) (a) in connection with the following matter:

A Notice of Intent Application filed under the *Massachusetts Wetlands Protection Act* and the *Town of Arlington Wetlands Protection Bylaw* by LEC Environmental Consultants, Inc., on behalf of the Applicant, Lori Philbin, with the Town of Arlington Conservation Commission on April 20, 2020 for property located at 105 Lafayette Street (Assessor's Parcel ID: 2-5-14) in Arlington, Massachusetts.

The form of notification, and a list of the abutters to whom it was given and their addresses, are attached to this Affidavit of Service.



Sharon A. Sullivan
Permitting Technician

4/20/2020

Date



April 20, 2020

CERTIFIED MAIL

«Name»

«Name2»

«Address»

«City», «State» «Zip»

Re: Notice of Intent Application
105 Lafayette Street
Assessor's Parcel ID: 2-5-14
Arlington, Massachusetts

[LEC File #: PhiL\11-166.02]

Dear Abutter:

On behalf of the Applicant, Lori Philbin, LEC Environmental Consultants, Inc. (LEC) has filed a Notice of Intent Application with the Arlington Conservation Commission to raze and rebuild an existing single-family dwelling and associated site appurtenances at the above-referenced site. Portions of the proposed activities are located within the 100-foot Buffer Zone to Bordering Vegetated Wetlands and the outer portion of the 200-foot Riverfront Area associated with Alewife Brook, and within Bordering Land Subject to Flooding. The Applicant proposes to implement erosion controls, and provide compensatory flood storage and stormwater management to minimize the potential for impacts to the resource areas and improve existing site conditions in accordance with the *Massachusetts Wetlands Protection Act* (M.G.L. c. 131, s. 40) and its implementing Regulations (310 CMR 10.00), and the *Town of Arlington Wetlands Protection Bylaw* (Article 8) and its *Wetlands Protection Regulations*.

The Notice of Intent Application and accompanying plans are available for review by the public at the Arlington Conservation Commission. The Public Hearing will be held at the Arlington Town Hall Annex, 730 Massachusetts Avenue, on May 7, 2020 beginning at 7:30 p.m., in accordance with the provisions of the *Massachusetts Wetlands Protection Act* (M.G.L. Ch. 131, s. 40, as amended) and its implementing Regulations (310 CMR 10.00), and the *Town of Arlington Wetlands Protection Bylaw* (Article 8) and its *Wetlands Protection Regulations*. Further information regarding this application will be published at least five (5) days in advance in *The Arlington Advocate*. Notice of the Public Hearing will also be posted at the Arlington Town Hall at least 48 hours in advance.

Due to Governor Baker's Covid-19 State of Emergency and further direction from the CDC, the Governor has suspended certain provisions of the Massachusetts Open Meeting Law. Please check the Town/Conservation Commission website for information relative to remote viewing and/or participation in the public hearing process.

Please do not hesitate to review the materials and/or attend the public hearing should you have questions or concerns about the proposed project.

Sincerely,

LEC Environmental Consultants, Inc.

Richard A. Kirby
Senior Wetland Scientist

LEC Environmental Consultants, Inc.

www.lecenvironmental.com

12 Resnik Road
Suite 1
Plymouth, MA 02360
508-746-9491
508-746-9492 (Fax)

PLYMOUTH, MA

380 Lowell Street
Suite 101
Wakefield, MA 01880
781-245-2500
781-245-6677 (Fax)

WAKEFIELD, MA

100 Grove Street
Suite 302
Worcester, MA 01605
508-753-3077
508-753-3177 (Fax)

WORCESTER, MA

P. O. Box 590
Rindge, NH 03461
603-899-4180
603-899-6726 (Fax)

RINDGE, NH

Notification to Abutters Under the

Massachusetts Wetlands Protection Act

and

the Town of Arlington Wetlands Protection Bylaw

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the *Town of Arlington Wetlands Protection Bylaw*, you are hereby notified of the following:

The Conservation Commission will hold a public hearing in the second floor conference room of the Town Hall Annex, 730 Massachusetts Avenue, Arlington, on Thursday, May 7, 2020 at 7:30 p.m. in accordance with the provisions of the *Massachusetts Wetlands Protection Act* (M.G.L. Ch. 131, s. 40, as amended) and the *Town of Arlington Bylaws*, Article 8, *Bylaw for Wetland Protection*, for a Notice of Intent from Lori Philbin, to raze and rebuild an existing single-family dwelling and associated site appurtenances at 105 Lafayette Street, within 100 feet of a wetland OR 200 feet of a Riverfront OR a floodway, on Assessor's Property Map #2, Lot #5-14.

A copy of the application and accompanying plans are available for inspection Monday - Thursday 8:00 a.m. – 4:00 p.m. and Friday 8:00 a.m. – Noon at the Conservation Commission office, first floor of the Town Hall Annex, 730 Massachusetts Avenue, Arlington, MA. For more information, call the Applicant's representative, LEC Environmental Consultants, Inc. at 781-245-2500 or the Arlington Conservation Commission at 781-316-3012, or the DEP Northeast Regional Office at 978-694-3200.

NOTE: Notice of the Public Hearing, including its date, time, and place, will be published at least five (5) days in advance in The Arlington Advocate and will also be posted at least 48 hours in advance in the Arlington Town Hall.



Office of the
Board of Assessors
Robbins Memorial Town Hall
Arlington, MA 02476
(781) 316-3050
Assessors@town.arlington.ma.us

Abutters List

Date: March 03, 2020

Subject Property Address: 105 LAFAYETTE ST Arlington, MA
Subject Property ID: 2-5-14

Search Distance: 100 Feet
CONSERVATION

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters within 100 feet of the property lines, of subject property.

Sam L. Feeley
Robert E. Greeley
[Signature]

Board of Assessors

Abutters List

Date: March 03, 2020

Subject Property Address: 105 LAFAYETTE ST Arlington,
MA
Subject Property ID: 2-5-14

Search Distance: 100 Feet

Prop ID: 15-2-1
Prop Location: 0-LOT THORNDIKE ST EXT Arlington, MA
Owner: METROPOLITIAN DIST COMM
Co-Owner:
Mailing Address:
20 SOMERSET STREET
BOSTON, MA 02108

Prop ID: 15-2-2
Prop Location: 0-LOT THORNDIKE ST EXT Arlington, MA
Owner: DEPT/CONSERVATION & RECREATION
Co-Owner: WATER SUPPLY PROTECTION DIV
Mailing Address:
20 SOMERSET ST
BOSTON, MA 02108

Prop ID: 2-5-1
Prop Location: 112 FAIRMONT ST Arlington, MA
Owner: WILDER ALFRED E/GAIL K
Co-Owner:
Mailing Address:
112 FAIRMONT STREET
ARLINGTON, MA 02474

Prop ID: 2-5-14
Prop Location: 105 LAFAYETTE ST Arlington, MA
Owner: PHILBIN DAVID & LORI
Co-Owner:
Mailing Address:
105 LAFAYETTE STREET
ARLINGTON, MA 02474

Prop ID: 2-5-2
Prop Location: 108 FAIRMONT ST Arlington, MA
Owner: KEANE LAWRENCE D
Co-Owner: DENNIS MARK
Mailing Address:
108 FAIRMONT ST
ARLINGTON, MA 02474

Prop ID: 2-5-3
Prop Location: 104-104A FAIRMONT ST Arlington, MA
Owner: FAZZOLARI FRANK A
Co-Owner: FAZZOLARI JOSEPH J
Mailing Address:
104 FAIRMONT ST
ARLINGTON, MA 02474

Prop ID: 2-5-5
Prop Location: 100 FAIRMONT ST Arlington, MA
Owner: BEGOT AURELIEN &
Co-Owner: ZIMMERMAN LARA E
Mailing Address:
100 FAIRMONT STREET
ARLINGTON, MA 02474

Prop ID: 2-7-2
Prop Location: 0-LOT LAFAYETTE ST Arlington, MA
Owner: DEPT/CONSERVATION & RECREATION
Co-Owner: WATER SUPPLY PROTECTION DIV
Mailing Address:
20 SOMERSET ST
BOSTON, MA 02108



Thorndike St

Fairmont St

Lafayette St

Alewife Brook Reservation

3
CAMBRIDGE

Concord Tpke

The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.

- Places by Category
 - Police Station
 - Fire Station
 - School
 - Library
 - Public Works
- Recreation - Facilities
 - Recreation - Fields Court
 - Recreation - Fields Court
- Open Space: Conservation
- Open Space - Minuteman
- Open Space - Labels
- Open Space
 - Town, State, or Private
 - Other Town Owned
- MA Highways
 - Interstate
 - US Highway
 - Numbered Routes
- Abutting Towns
- Town Boundary
- Parcels
- Buildings
- Cemetery - Roads
 - Road1
 - Road2
 - Road3
 - Road4
- Pavement Markings
 - Impervious Surface - For Street
 - Sidewalk
 - Street Island
 - Driveway
 - Parking Lot
 - Bike Path
- Roads - For Large Scale
- Roads - For Small Scale
 - Major Road
 - Local Road
- Master Plan Base Map - Water Line



**Notice of Intent Application
& Wetland Resource Area Analysis**

105 Lafayette Street
Assessor's Parcel ID: 2-5-14
Arlington, Massachusetts

April 20, 2020

1. Introduction

On behalf of the Applicant and Property Owner, Lori Philbin, LEC Environmental Consultants, Inc., (LEC) is filing the enclosed Notice of Intent (NOI) Application and *Wetland Resource Area Analysis* with the Arlington Conservation Commission under the *Massachusetts Wetlands Protection Act* (M.G.L. c. 131, s. 40, the *Act*), its implementing Regulations (310 CMR 10.00, the *Act Regulations*), the *Town of Arlington Wetlands Protection Bylaw* (Article 8, the *Bylaw*) and its implementing *Wetlands Protection Regulations* (March 1, 2018, the *Bylaw Regulations*). The Applicant is filing this NOI Application to raze and rebuild a single-family dwelling and associated site appurtenances within the 100-foot Buffer Zone to Bordering Vegetated Wetlands (BVW), the 200-foot Riverfront Area to Alewife Brook/Little River, and within Bordering Land Subject to Flooding (BLSF).

As part of this filing, the Applicant proposes to implement mitigation measures, including erosion controls, compensatory flood storage, and stormwater management. The existing conditions and proposed activities are depicted on *Grading/Drainage Plan - 105 Lafayette Street, Arlington, Massachusetts*, and *Details Plan* dated May 27, 2012 and revised through March 26, 2020, (*Site Plans*, Appendix B), prepared by Gala Simon Associates, Inc. Details of the stormwater management design, supporting calculations, and an Operation & Maintenance Plan are included in the *Engineering Drainage Calculations for 105 Lafayette Street, Arlington, Massachusetts*, dated March 26, 2020, and prepared by Gala Simon Associates, Inc (*Drainage Calculations*, attached).

2. General Site Description

The 4,839± square foot property is located in a residential neighborhood north of the Route 2/Alewife Brook Parkway interchange, and across Lafayette Street from the Alewife Greenway Bike Path, within the southeastern portion of Arlington, Massachusetts. More specifically, the property is located at the terminus of Lafayette Street off the northwest side. Residential development associated with Fairmont Street and Lafayette Street occurs north and east of the property, respectively, while undeveloped forested land within Alewife Brook Reservation occurs to the south and

west. The Little River transitions to Alewife Brook south of the site and occurs roughly 156 feet away, across the Alewife Greenway Bike Path, and flows northeasterly toward its convergence with the Mystic River.

The property contains a 1-story, single-family dwelling within the central portion of the site. Access to the dwelling is provided via a paved driveway extending northwest from Lafayette Street. A gravel walkway also extends from Lafayette Street to a paved patio and concrete landing at the front entrance. A wooden deck occurs off the rear of the dwelling. Two wooden sheds are located southwest of the dwelling on adjacent town land. The dwelling is surrounded by landscape plants and lawn areas (see Photo 1), including scattered Norway maple (*Acer platanoides*) and red maple (*Acer rubrum*) shade trees, entanglements of oriental bittersweet (*Celastrus orbiculatus*) and grape (*Vitis* sp.), and scattered patches of black raspberry (*Rubus alleghaniensis*), sapling black cherry (*Prunus serotina*), sapling mulberry (*Morus* sp.), sapling and seedling sumac (*Rhus* sp.), and individuals of porcelain berry (*Ampelopsis brevipedunculata*). The groundcover includes patches of day-lily (*Hemerocallis* sp.), smartweed (*Polygonum* sp.), lemon-balm (*Melissa officinalis*), violets (*Viola* sp.), and scattered patches of burdock (*Arctium minus*) and hostas (*Hosta* sp.), with individuals of dock (*Rumex* sp.), buttercup (*Ranunculus* sp.), and Asiatic dayflower (*Commelina communis*).



Photo 1. Westerly view of front entrance and lawn of dwelling.

Forested uplands occur southwest and southeast of the property within Alewife Brook Reservation. Vegetation within the forested uplands includes a canopy dominated by Norway maple, with patches black cherry. The understory contains patches of saplings, black raspberry, entanglements of oriental bittersweet, and individuals

of burning bush (*Euonymus alatus*), apple (*Malus* sp.), sapling sumac, sapling mulberry, and multiflora rose (*Rosa multiflora*). The groundcover includes scattered seedlings,

poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), garlic mustard (*Alliaria petiolata*), yellow wood sorrel (*Oxalis stricta*), and scattered individuals of celandine (*Chelidonium majus*).

Utilizing a hand-held, Dutch-style auger, LEC inspected soil conditions within the upland areas along the BVW boundary and observed a gravelly, loamy sand topsoil (A horizon) measuring 19± inches thick, with a soil matrix of 10YR 3/2. No redoximorphic features were observed within the soil profile. This soil profile is ‘non-hydric’ in accordance with *Field Indicators to Identifying Hydric Soils in New England* (Version 4, May 2018, the *Field Indicators Guide*).

2.1

Natural Heritage and Endangered Species Program Designation

According to the 14th Edition of the *Massachusetts Natural Heritage Atlas* (effective August 1, 2017) published by the Natural Heritage & Endangered Species Program (NHESP), no areas of Estimated or Priority Habitat for Rare Wildlife, or Potential or Certified Vernal Pools exist on the site (Appendix A, Figure 3).

3.

Wetland Boundary Determination Methodology

LEC conducted site evaluations on June 23, 2011 and August 2, 2019 to identify and characterize existing protectable Wetland Resource Areas located on or immediately adjacent to the site, and to delineate the off-site Bordering Vegetated Wetland (BVW) boundary and Bank-Mean Annual High Water (MAHW) Line associated with the Little River/Alewife Brook. The extent of Wetland Resource Areas was determined through observations of existing plant communities, hydrologic indicators, and Bankfull Indicators in accordance with the *Act*, its implementing *Regulations*, and the *Bylaw* and *Bylaw Regulations*.

Based on these methods, LEC determined that an offsite BVW occurs southwest of the property, while the Bank-MAHW Line associated with the Little River/Alewife Brook is located southeast of the subject property within Alewife Brook Reservation. LEC delineated the BVW boundary with sequentially numbered, blaze orange surveyor’s tape with the words “LEC Resource Area” printed in black. LEC flagging stations 1 through 5 demarcate the BVW boundary. The Bank-MAHW Line was established with sequentially-numbered safety blue surveyors’ tape labelled B-1 through B-4. The BVW

and Bank-MAHW Line boundaries were survey located by Rober Survey, and are depicted on the attached *Site Plans*. The off-site BVW boundary and Bank-MAHW Line place the 100-foot Buffer Zone and 200-foot Riverfront Area on the subject property.

4. Wetland Resource Areas

Wetland Resource Areas associated with the site include BVW, Riverfront Area, and BLSF. The 100-foot Buffer Zone extends onto the property from the BVW boundary, while the 200-foot Riverfront Area extends onto the property from the Bank-MAHW boundary to Alewife Brook. The entire property is located within BLSF.

4.1 Bordering Vegetated Wetlands

BVW is defined at 310 CMR 10.55(2) as: *freshwater wetlands which border on creeks, rivers, streams, ponds, and lakes...Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants...The boundary of Bordering Vegetated Wetlands is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist.*

According to the *Bylaw Regulations* [Section 21 B. (1) and (2)], *Vegetated Wetlands are freshwater wetlands, including both bordering vegetated wetlands (i.e., bordering on freshwater bodies such as on creeks, rivers, streams, ponds and lakes), and isolated vegetated wetlands which do not border on any permanent water body. The types of freshwater wetlands are wet meadows, marshes, swamps, bogs and vernal pools. Vegetated Wetlands are areas where soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The ground water and surface water hydrological regime, soils and the vegetational community which occur in each type of freshwater wetlands, including both bordering and isolated vegetated wetlands, are defined under the Bylaw based on G.L. c. 131, § 40. (2) The boundary of Vegetated Wetland, whether Bordering or Isolated, is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist. Wetland indicator plants shall include but not necessarily be limited to those plant species identified in the Act.*

An offsite BVW characterized as an emergent marsh occurs at the bottom of a steep slope descending southwesterly from the subject property. The sparse sapling layer within the marsh includes scattered individuals of sapling ash (*Fraxinus* sp.) along its edges. The marsh is otherwise dominated by common reed (*Phragmites australis*), with scattered patches of jewelweed (*Impatiens capensis*), and individuals of purple loosestrife (*Lythrum salicaria*), beggar-ticks (*Bidens* sp.), and climbing nightshade (*Solanum dulcamara*).

LEC inspected soils within the BVW using a hand-held, Dutch-style auger and observed a 17-inch thick, sapric organic layer (O_a layer) with a soil matrix color of 10YR 2/1, underlain by a 3-inch thick, fine sandy loam topsoil (A horizon) with a soil matrix color of 10YR 3/2, to a depth of 20+ inches. This soil profile meets the Histosol (A1.) indicator for a hydric soil in accordance with the *Field Indicators Guide*.

LEC flags 1 through 5 demarcate the BVW boundary as it relates to the subject property.

4.2

Bank-Mean Annual High Water

According to the *Act Regulations* [310 CMR 10.54 (2) (c)], Bank is the *first observable break in slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level*

According to the *Bylaw Regulations*, [Section 4. B. (9)] Bank is defined as *the portion of the land surface which normally abuts and confines a water body, often between the mean annual low flow level and the first observable break in the slope or the mean annual flood level, whichever is lower.*

According to the *Act Regulations* [310 CMR 10.58 (2) (a) 2], Mean Annual High Water (MAHW) is defined as *the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of point bars, changes in bank materials, or bank undercuts*

MAHW is not defined in the *Bylaw* or *Bylaw Regulations* so the above definition prevails.



Photo 2. Northeasterly view of Alewife Brook

The Little River transitions to Alewife Brook, and occurs roughly 156 feet south of the property, across from Lafayette Street and the Alewife Greenway Bike Path. The portion of the Brook associated with the subject property is contained within a 20 to 30-foot wide channel, and flanked by concrete Banks (see Photo 2.). A metal, chain-link fence occurs along a portion of the Bank.

4.3

Riverfront Area

According to the *Act Regulations* [310 CMR 10.58 2 (a)]: *Riverfront Area is defined as the area of land between a river's mean annual high water line and a parallel line measured horizontally 200 feet away.*

According to the *Bylaw Regulations* [Section 4. B. (68).], Riverfront Area is defined as *the area of land between a river's mean annual high water line and a parallel line measured 200 feet horizontally landward of the mean annual high water line.*

Riverfront Area includes land within 200 feet of the Bank-MAHW line associated with Alewife Brook and encompasses roughly the southeastern half of the property. This 2,321± square foot area comprises roughly the eastern half of the existing dwelling, the driveway, and the adjacent lawn and landscaped areas. The Riverfront Area on the site is considered 'previously developed,' while the footprint of the existing house and pavement, and gravel are considered 'degraded' in accordance with 310 CMR 10.58 (5).

4.4

Bordering Land Subject to Flooding

According to the *Act Regulations* [310 CMR 10.57 (2) (a) 1], Bordering Land Subject to Flooding (BLSF) *is an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of*

these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland.

According to the *Bylaw Regulations* [Section 23 B. (1)(a)(c)]. Bordering land subject to flooding is an area with low, flat topography adjacent to and inundated by floodwaters rising from brooks, creeks, rivers, streams, pond or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland. (c) The boundary of bordering land subject to flooding is the estimated or observed maximum lateral extent of floodwater which will theoretically result or has resulted from the statistical 1%-annual-chance flood (also known as the one-hundred-year frequency storm). 1. Said boundary shall be that determined by reference to the most recently available flood profile data prepared for the Town of Arlington within which the work is proposed under the National Flood Insurance Program (NFIP, currently administered by the Federal Emergency Management agency, successor to the U.S. Department of Housing and Urban Development). Said boundary, so determined, shall be presumed accurate. This presumption may be overcome only by credible evidence from a registered professional engineer or other professional competent in such matters. 2. Notwithstanding the foregoing, where NFIP profile data is unavailable or is determined by the Commission to be outdated, inaccurate or not reflecting current conditions, the boundary of bordering land subject to flooding shall be the maximum lateral extent of floodwater which has been observed or recorded...

According to the June 4, 2010 *Federal Emergency Management Agency Flood Insurance Rate Map* for Middlesex County, Massachusetts (Map No: 25017C0419E), the entire property is located within Zone AE (elevation 6.85 to 7; Datum NAVD 88): *Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood; Base Flood Elevations Determined* and Floodway Areas in Zone AE: *The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.*

BLSF is present where Zone AE extends beyond the BVW and/or Bank-MAHW boundaries to Elevation 6.8 to 7 (Datum: NAVD88), and therefore encompasses the entire property.

5. Proposed Construction Activities

5.1 Raze and Rebuild of a Single-Family Dwelling

The Applicant proposes to raze the existing 1,101± square-foot dwelling, and associated deck, driveway, and walkway, and construct a new 1,398± square-foot dwelling with a porous pavement driveway and front entrance walkway. The front (southeast) entrance walkway will provide access to a wood landing and steps, while the driveway will provide access to an additional wood landing and steps off the side (northeast) entrance of the dwelling. The two sheds located within the southwest portion of the site will be removed and converted to naturally-vegetated land.

In order to meet FEMA Building Code requirements, and in order to comply with compensatory flood storage requirements enumerated in the *Act* and *Bylaw*, the proposed dwelling will be constructed atop a crawl-space foundation. Seven (7) flood vents will be installed in the foundation walls to allow for flood water to ebb and flow as needed during anticipated flooding associated with the 0.1% annual chance flood.

While the new dwelling will measure roughly 25% larger than the existing dwelling, the total impervious area located on site will be decreased by 243± square feet. If one considers the change in impervious area only within the Riverfront Area, the impervious area reduces by 293± square feet. While 538 cubic feet of BLSF will be displaced with the project, minor grading of up to 1 foot east and north of the dwelling, and the proposed foundation with flood vents will provide 2,856± cubic feet of compensatory flood storage.

6. Mitigation Measures

The Applicant intends to implement erosion controls, and provide compensatory flood storage and stormwater management to mitigate for any potential impacts to resource areas, and improve the existing site conditions. A description of each of these mitigating measures is provided below.

6.1 **Erosion and Sedimentation Control**

The Applicant proposes to implement an erosion control program to protect the adjacent Wetland Resource Areas from sedimentation during construction activities. The plan for the control of potential impacts to the adjacent Wetland Resource Areas is based on DEP guidelines and will be comprised of staked compost filter tubes along the Limit-of-Work line, including a staked compost filter tube located on the eastern edge of Lafayette Street. All erosion control measures will remain in place until disturbed areas are stabilized by vegetation. The location of the proposed erosion controls and a detail are shown on the *Site Plans* (Appendix B).

6.2 **Stormwater Management**

While the project results in a decrease of impervious surface, both site-wide and within the Riverfront Area, and therefore not subject to Town of Arlington stormwater management requirements, the Applicant proposes to provide stormwater management for the run-off resulting from the rear of the proposed dwelling. Two (2) 50+ gallon rain barrels are proposed off the rear house corners, and the proposed driveway and walkway will be constructed of porous pavement. Porous pavement details are provided on the *Site Plans* (Appendix B) and drainage calculations showing no change or a reduction in the peak stormwater rates and volumes for the statistical 2, 10, 25, and 100-year storm events are provided in the *Drainage Calculations* (attached). A detailed Operation and Maintenance Plan also is included in the *Drainage Calculations*.

6.3 **Compensatory Flood Storage**

The project will result in a significant increase in flood storage associated with the site, via minor site grading, and flood vents and crawl space associated with the house foundation. As provided in the Flood Fill/Comp. Calculations Table on the *Site Plans*, a total of 538 cubic feet of filling within the floodplain is proposed, while 2,856 cubic feet of compensatory flood storage are proposed, with compensatory flood storage far exceeding floodplain fill for each incremental elevation between elevations 4 and 7 (NAVD 88). In all, a 5.3:1 ratio of compensatory flood storage to floodplain fill is proposed.

In addition to providing compensatory flood storage, the land area containing the two wooden sheds will be converted to a naturally-vegetated area, by way of installing twelve

(12) native shrubs, including six (6) witch hazel (*Hamamelis virginiana*) and six (6) American hazelnut (*Corylus americana*).

7. Regulatory Performance Standards

The *Act Regulations* and *Bylaw Regulations* provide specific performance standards for work within Riverfront Area and Bordering Land Subject to Flooding, and the *Bylaw Regulations* provide additional standards for climate resiliency. Citations of the pertinent performance standards are provided below, along with a description of how the project meets these standards.

7.1 Riverfront Area Performance Standards

While the proposed project is considered a ‘Redevelopment’ within ‘Previously Developed’ Riverfront Area in accordance with 310 CMR 10.58 (5), only a portion of the proposed development occurs within ‘degraded’ Riverfront Area. Regulations at 310 CMR 10.58 (5) (a) state:

...When a lot is previously developed, but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58 (4) shall be met.

Therefore, in addition to demonstrating compliance with the performance standards associated with ‘Previously Developed’ Riverfront Area in 310 CMR 10.58 (5) (provided below), pertinent citations of the performance standards under 310 CMR 10.58 (4) and a discussion of the project’s compliance with those standards is also provided. The performance standards outlined in 310 CMR 10.58 (4) include:

(a) Protection of Other Resource Areas: The proposed activities are also located within Bordering Land Subject to Flooding (BLSF). Compensatory Flood Storage is proposed to protect the function and value of the onsite BLSF;

(b) Protection of Rare Species: The site is not contained within Rare Species Habitat as noted above in Section 2.1;

(c) Practicable and Substantially Equivalent Economic Alternatives: An Alternatives Analysis is provided below; and

(d) No Significant Adverse Impact: A discussion of Significant Adverse Impact is provided below.

7.1.1

Alternatives Analysis

For this project, the scope of alternatives falls under 310 CMR 10.58 (4) (c) 2. a., which states:

The area under consideration for practicable alternatives is limited to the lot, for activities associated with the construction or expansion of a single-family house on a lot recorded on or before August 1, 1996

The purpose of this project is to replace a single-family dwelling in existence as of August 1, 1996. Under existing conditions, a portion of the dwelling and paved driveway are located within the Riverfront Area. While the proposed dwelling measures roughly 25% larger than the existing dwelling, the proposed dwelling is situated within the same general footprint of the existing dwelling, and only two feet closer to the river compared to the existing dwelling (183 feet compared to 185 feet). Despite this modest increase, the proposed alternative elevates the first floor of the structure two feet above the floodplain elevation; reduces impervious area site-wide, and within the Riverfront Area by 293± square feet; provides a 5.3:1 ratio of compensatory flood storage to BLSF fill, and proposes enhancement plantings where two off-site sheds currently exist. Overall, the proposed alternative protects the interests of the *Act* and *Bylaw* far greater than existing conditions or for a development with less mitigating measures.

7.1.2

No Significant Adverse Impact

310 CMR 10.58 (4) (d) states:

The work, including proposed mitigating measures, must have no significant adverse impact on the riverfront area to protect the interests identified in M.G.L. c. 131, s. 40...

310 CMR 10.58 (4) (d) 1. states:

Within 200 foot Riverfront Areas, the issuing authority may allow the alteration of up to 5000 square feet or 10% of the riverfront area within the lot, whichever is greater, on a lot recorded on or before October 6, 1997 or lots recorded after October 6, 1997 subject to the restrictions of 310 CMR 10.58 (4) (c) 2.b.vi., or up to 10% of the riverfront area within a lot recorded after October 6, 1997, provided that:

The property contains 2,321± square feet of Riverfront Area; therefore, 10% of the total Riverfront Area on the site is 232± square feet, which is significantly less than the 5,000 square-foot threshold enumerated above. The project results in a net improvement to the Riverfront Area by reducing impervious surface and by providing stormwater management where none exists today.

- (a) *At a minimum, a 100-foot wide area of undisturbed vegetation is provided...If there is not a 100-foot wide area of undisturbed vegetation within the riverfront area, existing vegetative cover shall be preserved or extended to the maximum extent feasible to approximate a 100-foot wide corridor of natural vegetation...*

The 0-100' Riverfront Area is located off site, and the southeastern property boundary measures 156 linear feet from the Bank-MAHW Line at its closest point. The lot is separated from the Little River/Alewife Brook by Lafayette Street and the Alewife Greenway Bike Path, which occurs within the Alewife Greenway. The existing lawn/landscape within the Riverfront Area will be replaced, and the existing paved driveway will be replaced with a porous pavement driveway. The existing corridor of natural vegetation within the Riverfront Area, to the extent it exists, will remain and impervious area will be located farther from the river compared to existing conditions.

- (b) *Stormwater is managed according to the standards established by the Department in its Stormwater Policy.*

While stormwater management is not required by DEP for single-family dwellings, the Applicant proposes a reduction in impervious surface both site-wide and within the Riverfront Area. Rain barrels also are proposed off the rear house corners to collect roof run-off.

- (c) *Proposed work does not impair the capacity of the riverfront area to provide important wildlife habitat functions...*

The preamble to 310 CMR 10.58 for Riverfront Area states that 'in those portions so extensively altered by human activity that their important wildlife habitat functions have been effectively eliminated, riverfront areas are not significant to the protection of important wildlife habitat...' This language mirrors the preamble language in 310 CMR 10.57 which includes a statement that such areas include paved areas, buildings, lawns, etc. The portion of Riverfront Area slated for development

contains an existing structure, pavement, lawn, and landscaped areas. Furthermore, the proposed development includes a net reduction of impervious surface for the site and within the Riverfront Area.

- (d) *Proposed work shall not impair groundwater or surface water quality by incorporating erosion and sedimentation controls and other measures to attenuate nonpoint source pollution.*

Erosion controls will be installed along the Limit-of-Work line, including on the eastern side of Lafayette Street, and porous pavement and rain barrels are proposed for stormwater management.

7.1.3

Redevelopment Within Previously Developed Riverfront Areas

The *Act Regulations* provide performance standards for work within ‘previously developed’ Riverfront Area. Below are citations of the pertinent performance standards and an explanation of the project’s compliance with the performance standards.

Redevelopment Within Previously Developed Riverfront Areas: Restoration and Mitigation. *Notwithstanding the provisions of 310 CMR 10.58 (4) (c) and (d), the issuing authority may allow work to redevelop a previously developed riverfront area, provided the proposed work improves existing conditions. Redevelopment means replacement, rehabilitation, or expansion of existing structures...A previously developed riverfront area contains areas degraded prior to August 7, 1996 by impervious surfaces from existing structures or pavement, absence of topsoil...Work to redevelop previously developed riverfront area shall conform to the following criteria:*

- (a) *At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131, s. 40. When a lot is previously developed but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58 (4) shall be met.*

Impervious surface within the Riverfront Area will be reduced by 293± square feet and impervious surfaces will be situated farther from the river compared to existing conditions.

- (b) *Stormwater management is provided according to standards established by the Department.*

The DEP does not require stormwater management for single-family dwelling construction. However, a reduction in impervious surface, porous pavement, and rain barrels are proposed.

- (c) *Within 200-foot riverfront areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less....*

All work will be located greater than 100 feet from the Little River/Alewife Brook, and no work is proposed closer to the Little River/Alewife Brook compared to existing conditions.

- (d) *Proposed work, including expansion of structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58 (5) (f) or (g).*

All work is located within the outer 200-foot Riverfront Area to Alewife Brook.

- (e) *The area of proposed work shall not exceed the amount of the degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58 (5) (f) or (g).*

The project site contains 2,321± square feet of Riverfront Area; therefore, 10% of the total Riverfront Area on the site is 232± square feet. The existing degraded Riverfront Area measures 816± square feet, and will be reduced to 523± square feet.

- (f) *When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58 (5) (c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river shall be selected for restoration...*

No restoration of degraded riverfront area is proposed or required in accordance with 310 CMR 10.58 (5) (f).

- (g) *When an applicant proposes mitigation either on-site or in the riverfront area within the same general area of the river basin, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), or (e) at a ratio in square feet of at least 2:1 of mitigation area to area of alteration not conforming to the criteria or an equivalent level of environmental protection where square footage is not a relevant*

measure. Alteration not conforming to the criteria shall begin at the riverfront area boundary...

No mitigation or restoration is proposed in accordance with 310 CMR 10.58 (5) (g).

7.2

Bordering Land Subject to Flooding Performance Standards

The *Act Regulations* at 310 CMR 10.57 (4) state that *work within BLSF shall conform to the following criteria:*

(a) *Bordering Land Subject to Flooding*

(1) Compensatory storage shall be provided for all flood storage volume that will be lost as a result of the proposed work.

While the project will result in 538± cubic feet of floodplain displacement, the crawl space house foundation with flood vents and minor site grading will provide 2,856 cubic feet of flood storage between Elevations 4 through 7, resulting in a 5.3:1 ratio of compensatory flood storage to flood displacement. Care will be taken to ensure that the proposed amount of flood storage is provided, in part by establishing grade stakes throughout the site during the construction activities.

(2) Work within BLSF...shall not restrict flows so as to cause an increase in flood stage or velocity.

Proposed work in the floodplain will not restrict flows or cause an increase in flood storage.

(3) Work within those portions of Bordering Land Subject to Flooding found to be significant to the protection of wildlife habitat shall not impair its capacity to provide important wildlife habitat functions...a project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987 that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions.

According to the BLSF Preamble at 310 CMR 10.57 (1) (a) 3., *Certain portions of Bordering Land Subject to Flooding are also likely to be significant to the*

protection of wildlife habitat...except for those portions of which have been so extensively altered by human activity that their important wildlife habitat functions have been effectively eliminated (such "altered" areas include paved and graveled areas...buildings, lawns, gardens)...

The proposed project will occur entirely within the existing footprint of the existing dwelling, lawn, and other impervious areas and will not impair wildlife habitat functions.

(b) Protection of Rare Wildlife Species

(1) Notwithstanding the provisions of 310 CMR 10.57(4)(a) or (b), no project may be permitted which will have any adverse effect on specified wildlife habitat sites of rare vertebrate or invertebrate species.

There are no specified wildlife habitat sites of rare vertebrate or invertebrate species located on the project site; therefore, the proposed project will have no adverse effect on any such sites.

7.3

Bylaw Performance Standards for Work Within the Floodplain

Section 23 D. of the *Bylaw Regulations* states: *The Commission may permit activity on land subject to flooding provided it shall not result in the following:*

(1) Flood damage due to filling which causes lateral displacement of water that would otherwise be confined within said area.

The project has been designed to provide a 5.3:1 ratio of compensatory flood storage to floodplain displacement and will not result in any increased lateral displacement of flood water.

(2) Adverse effect on public and private water supply or groundwater supply, where said area is underlain by pervious material.

The project will not result in any increase in pollutants that could otherwise potentially result in an adverse effect on public or private water supply or groundwater supply.

(3) An adverse effect on the capacity of said area to prevent pollution of the groundwater, where the area is underlain by pervious material which in turn is covered by a mat of organic peat and muck.

LEC did not observe any such conditions within or near the subject property, and a soil test pit conducted on the site (and described on the *Site Plans*) revealed fine sandy loam to loamy fine sand soils to a depth of 50 inches.

7.4

BLSF Climate Change Impacts

The *Bylaw Regulations* (Section 23 D.) also state that *the applicant shall take into consideration the impacts of climate change on the activities proposed on land subject to flooding, especially in terms of the compensatory flood storage as a climate change resilience strategy. Any such activity shall provide compensatory flood storage for all flood storage volume that will be lost at each elevation. Compensatory flood storage shall be at a 2:1 ratio, minimum, for each unit volume of flood storage lost at each elevation.*

As described above in Section 6.2 of this NOI Report, Project Engineer Al Gala of Gala Simon Associates, Inc., has designed the project to provide a 5.3:1 ratio of proposed flood storage compared to existing flood storage, as provided on the *Flood Fill/Comp. Calculations* section of the *Site Plans*. Work is proposed within BLSF between elevations 4 and 7. A >2:1 increase in available flood storage is provided for each incremental elevation. The first floor of the proposed dwelling (elevation 8.8) will be elevated two feet above the 0.1% Annual Chance Floodplain (elevation 6.8) and flood vents will be installed within the crawl-space foundation walls in order to minimize storm and flood damage. A total of twelve (12) enhancement plantings are proposed within the southwest corner of the property to re-vegetate the land where two sheds will be removed, and impervious area within the entire lot will be decreased.

8.

Summary

On behalf of the Applicant and Property Owner, Lori Philbin, LEC is filing the enclosed NOI Application and *Wetland Resource Area Analysis* with the Arlington Conservation Commission to raze and rebuild a single-family dwelling at 105 Lafayette Street in Arlington, Massachusetts. Portions of the proposed activities will occur within the outer portion of Riverfront Area associated with the Little River/Alewife Brook, and within the 100-foot Buffer Zone to BVW and BLSF, as jurisdictional under the *Act*, its implementing *Regulations*, and the *Bylaw* and *Bylaw Regulations*.

The new dwelling is situated in the same general footprint of the existing dwelling, and a reduction in impervious area site-wide and within the Riverfront Area are proposed. Rain barrels also will improve stormwater management associated with the site. The project results in a 5.3:1 ratio of compensatory flood storage to BLSF fill. Providing this additional flood storage, setting the first-floor elevation two feet higher than the BLSF elevation, reducing impervious area, and providing enhancement plantings also contribute to the climate resiliency associated with the project.

The proposed project, including the proposed mitigating measures, meets or exceeds the performance standards enumerated in the pertinent Statutes and Regulations. Accordingly, the Applicant requests that the Commission issue an Order of Conditions approving the project.

Arlington Conservation Commission, *Town of Arlington Wetlands Protection Bylaw* (Article 8) Town of Arlington, Massachusetts.

Massachusetts Department of Environmental Protection, Division of Wetlands and Waterways 1995. *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act, A Handbook*. 89 pp.

Massachusetts Natural Heritage and Endangered Species Program Atlas of Estimated Habitat of State-listed Rare Wetlands Wildlife, Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, Route 135, Westborough, MA 01581, www.state.ma.us/dfwele/dfw

Massachusetts Wetlands Protection Act (M.G.L. c. 131, §. 40), www.state.ma.us/dep
Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00),
www.state.ma.us/dep

National Flood Insurance Program, Federal Emergency Management Agency Flood Insurance Rate Map, Middlesex County, June 4, 2010.

New England Hydric Soils Technical Committee. 2018, 4th ed., *Field Indicators for Identifying Hydric Soils in New England*, New England Interstate Water Pollution Control Commission, Lowell, MA.

Reed, P.B. 1988. *National List of Plant Species that Occur in Wetlands: 1988 Massachusetts*. U.S. Department of the Interior, Fish and Wildlife Service. NERC-88/18.21

Appendix A

Locus Maps

Figure 1: USGS Topographic Quadrangle

Figure 2: FEMA Flood Insurance Rate Map

Figure 3: MassGIS Orthophoto & NHESP Estimated Habitat Map

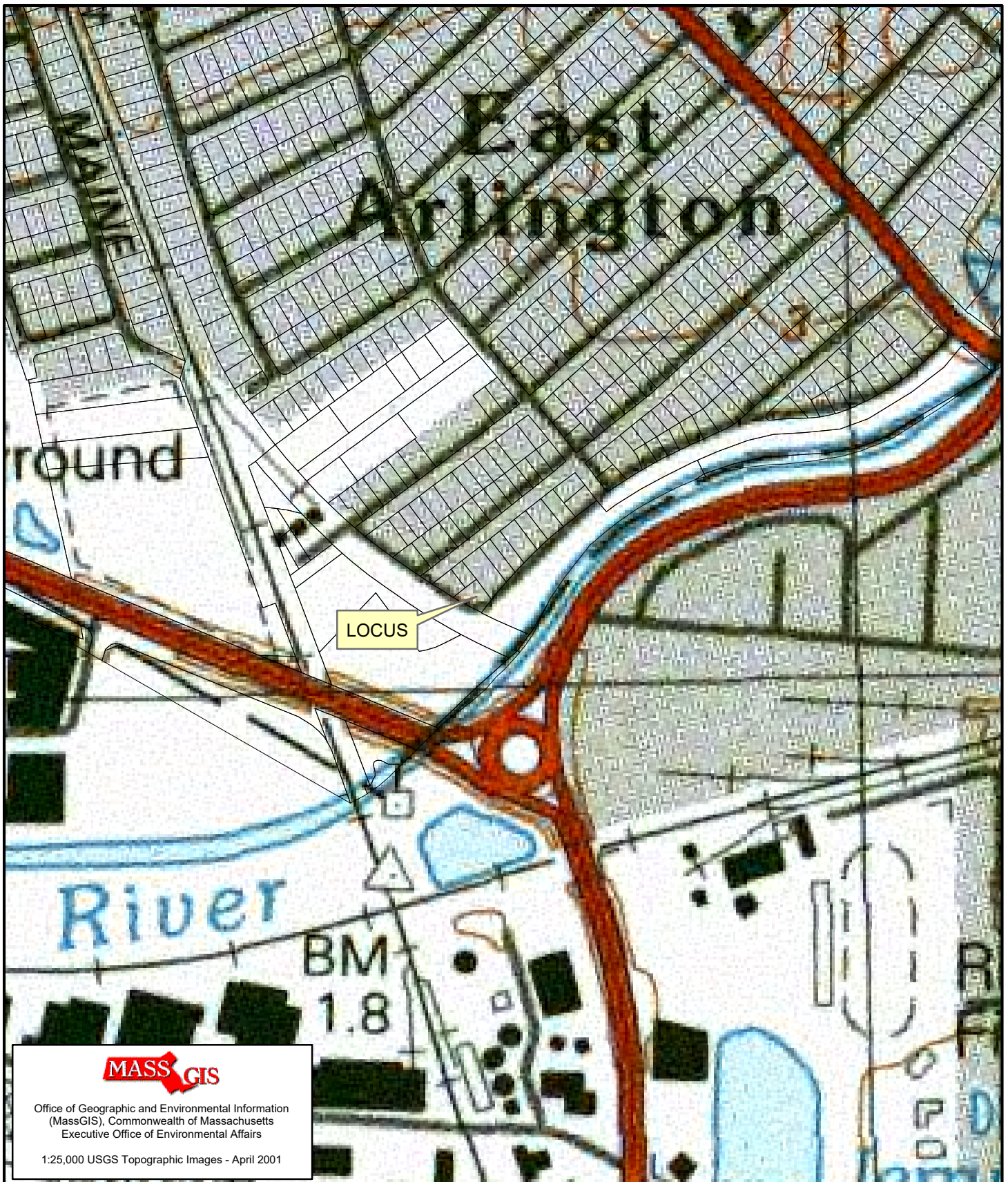
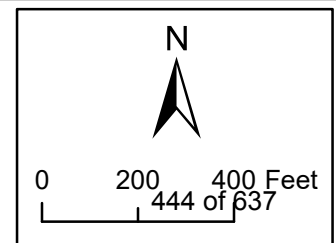
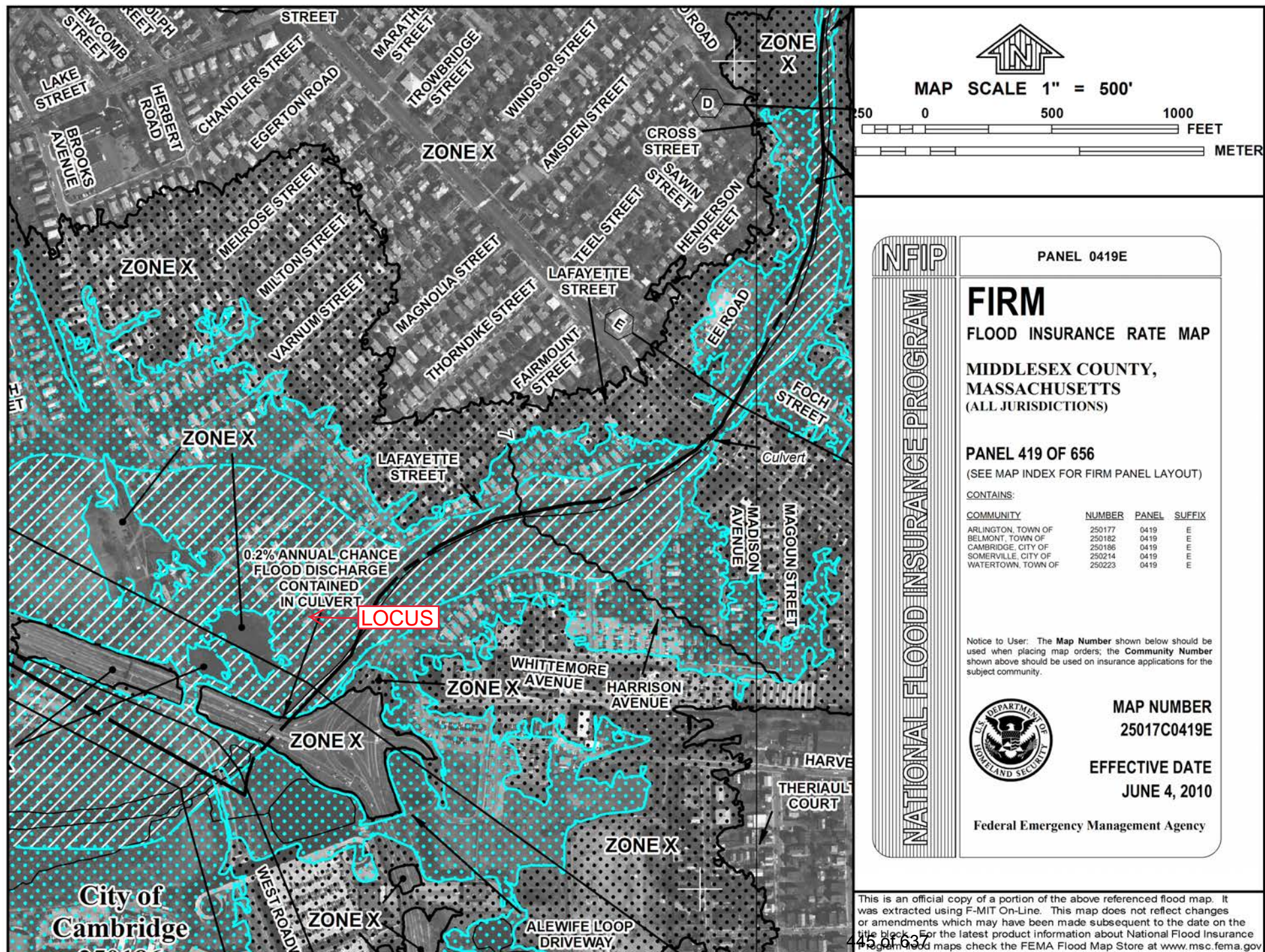


Figure 1: USGS Topographic Map
105 Lafayette Street
Arlington, MA

April 14, 2020





LEGEND



SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.



FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.



ZONE X

OTHER FLOOD AREAS

Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.



ZONE X

OTHER AREAS

Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D

Areas in which flood hazards are undetermined, but possible.



COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS



OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.



1% annual chance floodplain boundary



0.2% annual chance floodplain boundary



Floodway boundary



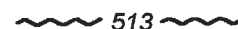
Zone D boundary



CBRS and OPA boundary



Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.



Base Flood Elevation line and value; elevation in feet*

(EL 987)

Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988



Cross section line



Transect line

87°07'45", 32°22'30"

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

2476000mN

1000-meter Universal Transverse Mercator grid values, zone 19

600000 FT

5000-foot grid values: Massachusetts State Plane coordinate system, Mainland zone (FIPZONE 2001), Lambert Conformal Conic projection

DX5510 x

Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5

River Mile

MAP REPOSITORY

Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP

June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL



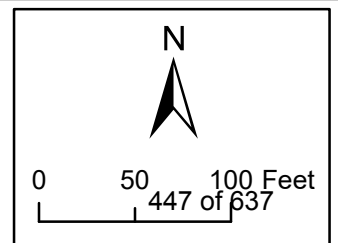
Environmental Consultants, Inc.

Wakefield, MA
781.245.2500

www.lecenvironmental.com

Figure 3: MassGIS Orthophoto & NHESP Map
105 Lafayette Street
Arlington, MA

April 14, 2020



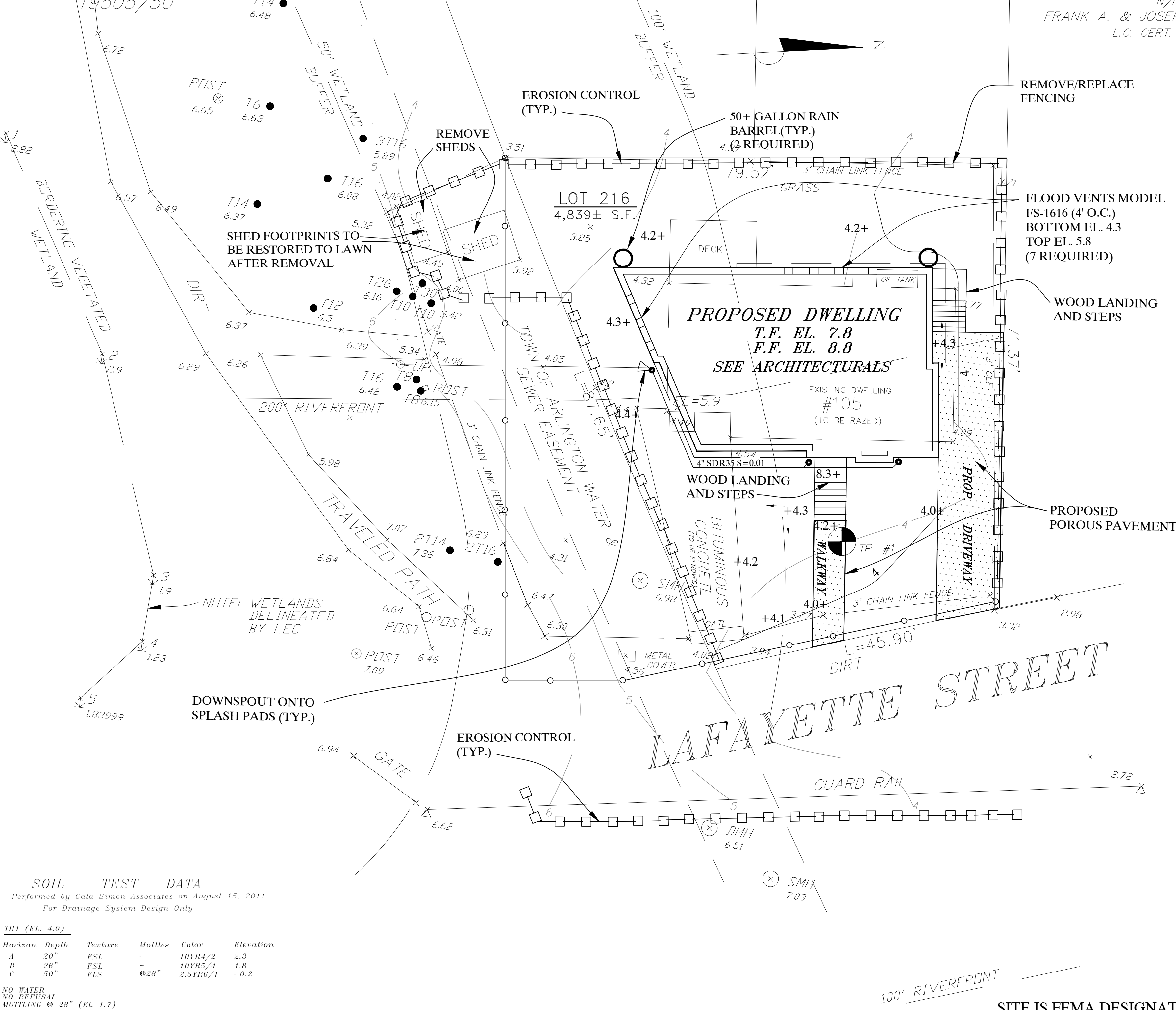
Appendix B

Drainage/Grading Plan 105 Lafayette Street, Arlington, Massachusetts,
dated May 27, 2012 and revised through March 26, 2020, prepared by Gala Simon Associates, Inc.

LEGEND

- TP
R
I
98
+99.7
● C.O.
- SOIL TEST PIT
RIM
INVERT
PROP. CONTOUR
PROP. SPOT EL.
PROP. CLEAN OUT

N/F
TOWN OF ARLINGTON
19505/50



SOIL TEST DATA

Performed by Gala Simon Associates on August 15, 2011
For Drainage System Design Only

TH1 (EL. 4.0)					
Horizon	Depth	Texture	Mottles	Color	Elevation
A	20"	FSL	-	10YR4/2	2.3
B	26"	FSL	-	10YR5/4	1.8
C	50"	FLS	⊙28"	2.5YR6/1	-0.2
NO WATER NO REFUSAL MOTTILING ⊙ 28" (EL. 1.7)					

Existing Flood Storage			Proposed Flood Storage		
El.	Area (s.f.)	Volume (c.f.)	El.	Area (s.f.)	Volume (c.f.)
4.0	1649	2714	4.0	1292	4688
5.0	3779	3779	5.0	4688	4688
6.0	3779	3779	6.0	4688	4688
7.0	3779	3779	7.0	4688	4688

FLOOD STORAGE CALCULATIONS WITHIN PROPERTY

NOTE: CALCULATIONS FOR FLOOD STORAGE UNDER PROPOSED CONDITIONS WERE PERFORMED INCLUDING THE TOTAL VOLUME ENTERING THE FOUNDATION THROUGH THE VENTS.

449 of 637

SITE PLAN

SCALE: 1" = 10'

Filled Flood Storage			Compensatory Flood Storage		
El.	Area (s.f.)	Volume (c.f.)	El.	Area (s.f.)	Volume (c.f.)
4.0	475	298	4.0	952	952
5.0	120	120	5.0	952	952
6.0	120	120	6.0	952	952
7.0	120	120	7.0	952	952

FLOOD FILL/COMP. CALCULATIONS

NOTE: COMPENSATORY VOLUMES CALCULATED IN AREAS NOT PREVIOUSLY CONSIDERED FLOODPLAIN INITIAL ELEVATION AT 4.0 FOR SIMPLIFICATION

TOWN OF ARLINGTON
ENGINEERING DIVISION

INSPECTION SIGN OFF:

1. BOTTOM OF BEDS	INSPECTOR	DATE
2. POST INSTALLATIONS PRIOR TO BACKFILL	INSPECTOR	DATE

SUMMARY OF STORMWATER RUNOFF AND VOLUME

STORM EVENT	EXISTING CONDITIONS PEAK		PROPOSED CONDITIONS PEAK	
	Runoff (cfs)	Volume (af)	Runoff (cfs)	Volume (af)
2-year (3.23 in)	0.20	0.014	0.20	0.014
10-year (4.90 in)	0.49	0.033	0.46	0.031
25-year (6.20 in)	0.73	0.049	0.69	0.046
100-year (8.89 in)	1.26	0.086	1.18	0.080

PRE VS. POST IMPERVIOUS AREAS

RUNOFF SURFACE	EXISTING (SF)	PROPOSED (SF)
ROOF	1,101	1,398
DRIVEWAY	406	0
SHED	134	0
TOTAL	1,641	1,398

RIVERFRONT IMPERVIOUS AREAS

EXISTING (SF)	PROPOSED (SF)
816	523

GENERAL NOTES

- EXISTING CONDITIONS SURVEY INFORMATION OBTAINED FROM ROBER SURVEY, ARLINGTON, MA. OWNER/CLIENT ASSUMES ALL RESPONSIBILITY FOR SOURCES AND AUTHORIZATION TO USE ELECTRONIC AND RECORD FILES.
- THE CONTRACTOR SHALL VERIFY ALL EXISTING INFORMATION ON THE GROUND AND SHALL REPORT ALL DISCREPANCIES TO THE ENGINEER IMMEDIATELY FOR A DECISION PRIOR TO CONSTRUCTION.
- ALL AREAS OUTSIDE OF THE LIMIT OF WORK LINES SHALL NOT BE DISTURBED IN ANY MANNER BY THE CONTRACT OPERATIONS. THE CONTRACTOR SHALL KEEP OUT OF THESE AREAS AND PRESERVE THEIR EXISTING CHARACTER.
- INSTALL TEMPORARY EROSION CONTROL MEASURES PRIOR TO CONSTRUCTION FOR APPROVAL BY THE DESIGN ENGINEER AND CONSERVATION COMMISSION.
- PROVIDE SMOOTH TRANSITION AT CHANGES IN GRADE EXCEPT AS INDICATED ON THE DRAWINGS AND AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNDERGROUND UTILITY LINES, ACTIVE OR NOT, AND SHALL MAINTAIN A CLOSE AND CONSTANT CONTACT WITH ALL UTILITY COMPANIES INVOLVED. CALL DIG-SAFE 888-344-7233 THE TOWN OF ARLINGTON WATER AND SEWER DIVISION IS NOT A MEMBER OF DIGSAFE.
- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988 DATUM.
- CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS, PERMITTING, AND LICENSES ISSUED AT THE FEDERAL, STATE AND LOCAL AGENCIES.
- CONTRACTOR SHALL COORDINATE ALL SITE UTILITY IMPROVEMENTS WITH THE TOWN OF ARLINGTON OFFICIALS.
- ENGINEER IS TO BE CONTACTED BY CONTRACTOR TO PERFORM AS BUILT MEASUREMENTS.
- OWNER/DEVELOPER IS TO COMPLY WITH ALL OF MASSACHUSETTS DEP SITE DEVELOPMENT REGULATIONS.
- ROADWAY IS TO BE SWEEPED, OR OTHERWISE CLEANED OF DEBRIS AND SEDIMENT, AT THE END OF EACH WORKDAY.
- CONTRACTOR IS TO COORDINATE INSPECTIONS OF THE SUBSURFACE DRAINAGE SYSTEM WITH THE TOWN OF ARLINGTON ENGINEERING DIVISION. ONE INSPECTION WILL BE REQUIRED FOR THE BOTTOM OF THE BED AND ANOTHER AFTER INSTALLATION AND PRIOR TO BACKFILLING. ENGINEERING DIVISION REQUIRES 24 HOURS ADVANCE NOTICE.
- ADDITIONAL PERMITTING WILL BE REQUIRED THROUGH THE ARLINGTON ENGINEERING DIVISION FOR PROPOSED CUT AND CAP ACTIVITIES, WATER SERVICE INSTALLATION, SEWER SERVICE INSTALLATION, AND CURB CUT WORK.
- AN AS-BUILT PLAN OF THE SURFACE DRAINAGE SYSTEM AND ANY IMPERVIOUS AREAS ON SITE SHALL BE PROVIDED TO THE TOWN OF ARLINGTON ENGINEERING DIVISION FOLLOWING INSTALLATION. THIS PLAN SHALL INCLUDE SWING TIES, ELEVATIONS, AND OFFSETS.
- THE CONTRACTOR IS TO PROVIDE A FIELD AS-BUILT SKETCH, TO THE ENGINEERING DIVISION AT THE TIME OF INSPECTIONS.
- SHOULD SUBSURFACE CONDITIONS VARY FROM THOSE IN THE TEST HOLES, THE DESIGN ENGINEER SHALL BE CONTACTED AND ANY REVISIONS TO THE STORM WATER PLAN SHALL BE SUBMITTED TO THE ENGINEERING DIVISION FOR REVIEW.
- ALL TREE ROOTS ENCOUNTERED DURING EXCAVATION SHALL BE CUT CLEANLY UNDER THE SUPERVISION /DIRECTION OF A CERTIFIED ARBORIST.
- CONTRACTOR IS TO MINIMIZE ABUTTER IMPACTS DURING DEMOLITION OF THE EXISTING DWELLING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE WITHIN OR OUTSIDE THE LIMIT OF WORK DUE TO CONTRACTOR OPERATIONS. CONTRACTOR SHALL RESTORE ANY DAMAGED AREAS TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR IS TO VERIFY DWELLING DIMENSIONS WITH ARCHITECTURAL PLANS.
- EXISTING CONTOURS PREPARED BY GSA BY INTERPOLATION OF SURVEY SPOT ELEVATIONS.

DRAINAGE NOTES:

- CONTRACTOR IS RESPONSIBLE FOR THE VERTICAL AND HORIZONTAL CONTROLS OF THE PROJECT.
- CONTRACTOR IS TO REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION OF HOUSE DOWNSPOUTS AND ELEVATIONS.
- THE MINIMUM CLEARANCE FROM THE BOTTOM OF THE POROUS PAVEMENT SYSTEMS TO REFUSAL OR GROUNDWATER IS 12 INCHES.
- IN THE EVENT THAT THIS CLEARANCE CANNOT BE MAINTAINED, ENGINEER IS TO BE NOTIFIED.
- ALL DRAINAGE PIPING IS SDR35 PVC.
- STORMWATER RUNOFF SHALL NOT BE DIRECTED ACROSS ADJACENT PROPERTY LINES.

Gala Simon
Associates Inc.

394 LOWELL STREET, SUITE 18
LEXINGTON, MA 02420
Tel: (781) 676-2962

Gala Simon Associates

GSA

Civil Engineers

GRADING/DRAINAGE

PLAN

105 LAFAYETTE STREET

ARLINGTON, MASSACHUSETTS

Job No. 1120		Date: 5/27/12
Drawn By: AG		Scale: AS SHOWN
Rev#	Date:	Description:
1	5/23/13	House
2	3/26/20	House

C-0

UTILITY NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THIS PLAN, PRIOR TO ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BEFORE PROCEEDING WITH THE WORK.

THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES SUCH AS CATCH BASINS, MANHOLES, WATERGATES, ETC. AND COMPILED FROM PLANS SUPPLIED BY VARIOUS UTILITY COMPANIES AND GOVERNMENT AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, ALL UTILITY COMPANIES OR AGENCIES PRIOR TO ANY EXCAVATION WORK. CALL DIG-SAFE AT 1-888-344-7233

CALL THE TOWN OF ARLINGTON WATER AND SEWER DIVISION AT 781-316-3310 FOR A MARKOUT. THE TOWN OF ARLINGTON WATER AND SEWER DIVISION IS NOT A MEMBER OF DIG-SAFE.

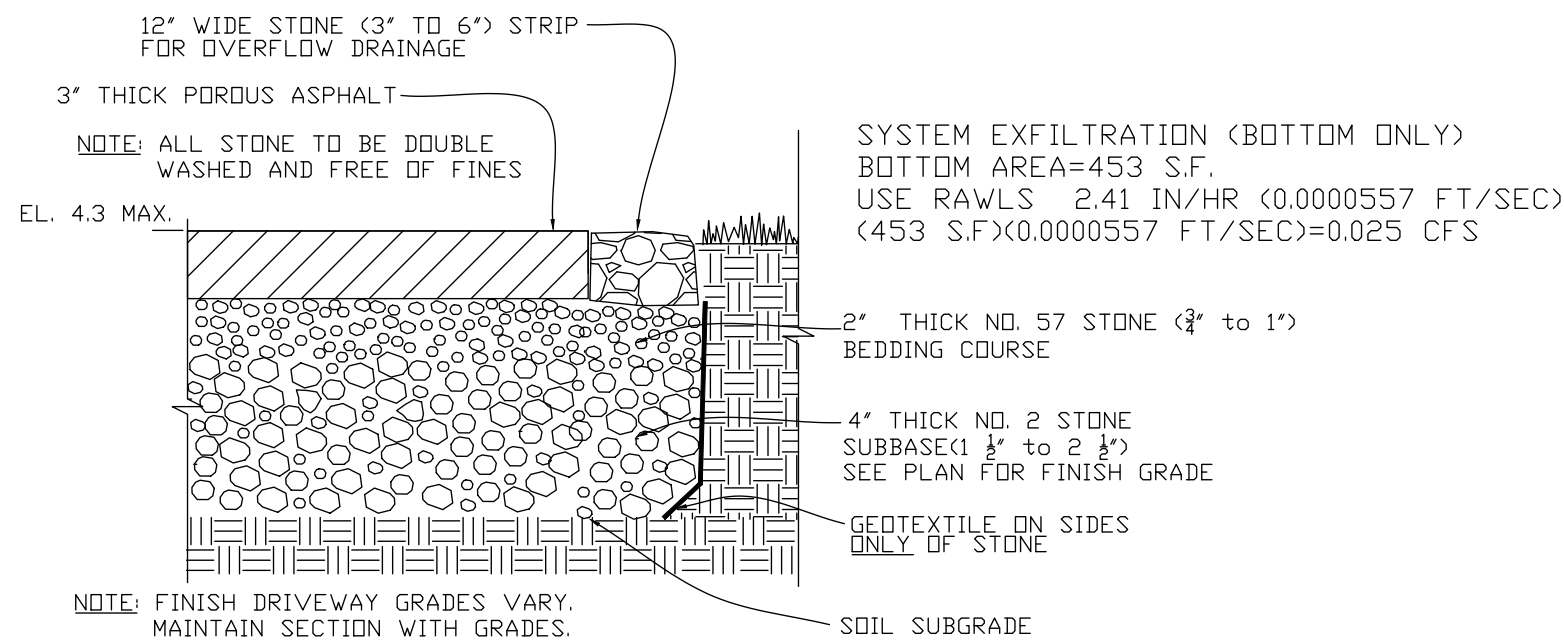
ADDITIONAL PERMITTING WILL BE REQUIRED THROUGH THE ARLINGTON ENGINEERING DIVISION FOR PROPOSED CUT AND CAP ACTIVITIES, WATER SERVICE INSTALLATION, SEWER SERVICE INSTALLATION, AND CURB CUT WORK.

AS BUILT NOTE:

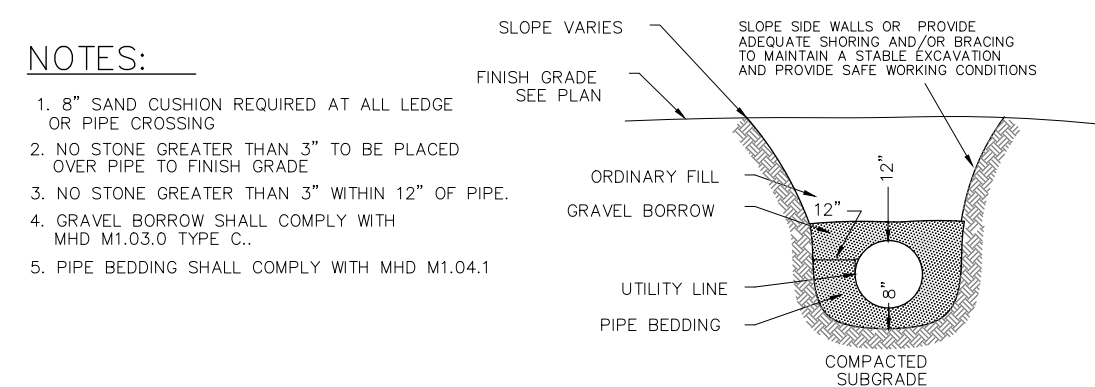
CONTRACTOR IS TO CONTACT ENGINEER FOR AS-BUILT MEASUREMENTS .

LAYOUT & GRADING NOTES

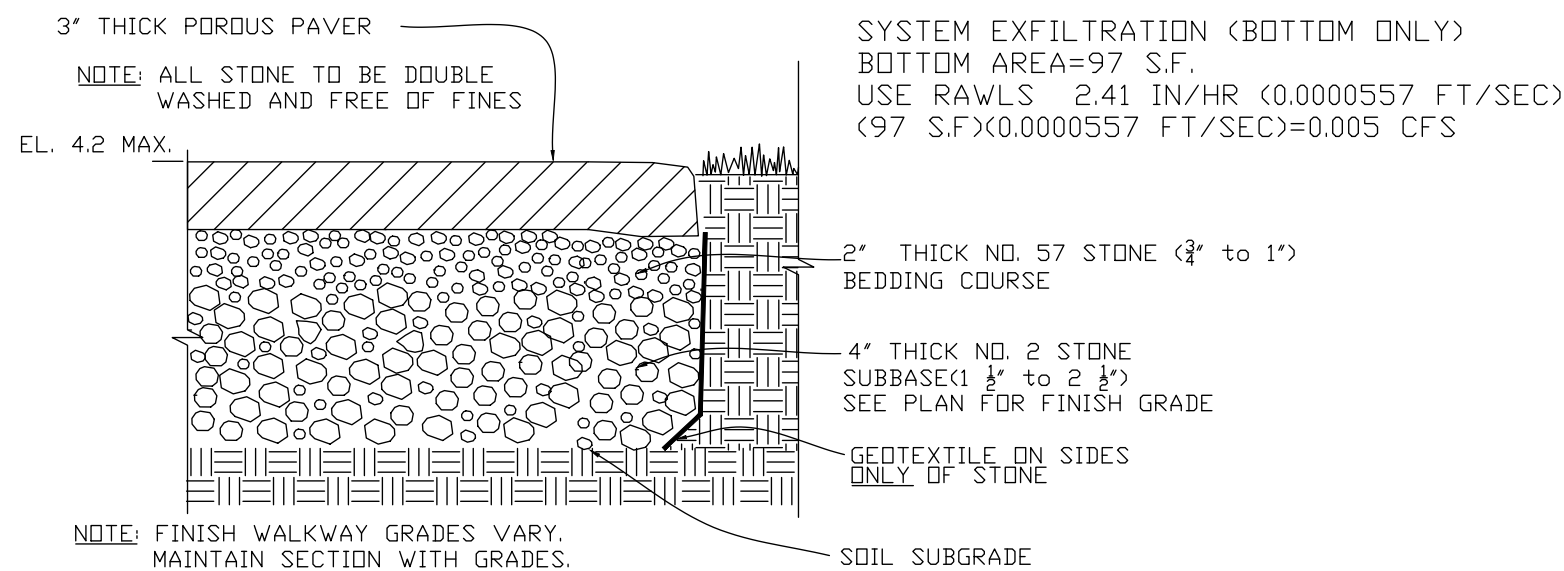
- CONSULT ALL DRAWINGS AND SPECIFICATIONS FOR COORDINATION REQUIREMENTS BETWEEN ALL TRADES PRIOR TO COMMENCING NEW CONSTRUCTION.
- LOCATION OF EXISTING UTILITIES SHOWN ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL CONTACT THE PROPER AUTHORITIES IN WRITING TO CONFIRM THE LOCATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE INCURRED DURING CONSTRUCTION TO ANY UTILITY SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
- CONTRACTOR TO REFER TO A SURVEYOR PLOT PLAN FOR ACCURATE OFFSETS TO TO PROPERTY LINE.



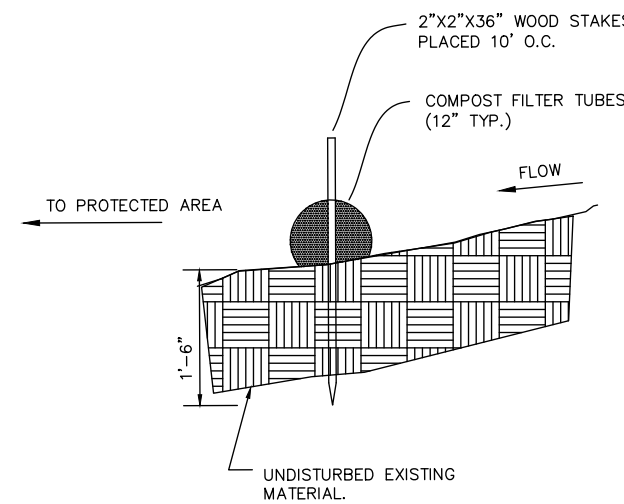
1 BITUMINOUS POROUS PAVEMENT
C-1 SCALE: NTS (DRIVEWAY)



2 TYP. UTILITY TRENCH
C-1 SCALE: NTS



3 POROUS PAVER DETAIL
C-1 SCALE: NTS (WALKWAY)



4 EROSION CONTROL
C-1 SCALE: NTS

DETAILS

105 LAFAYETTE STREET
ARLINGTON, MASSACHUSETTS

Gala Simon Associates Inc.
394 LOWELL STREET, SUITE 18
LEXINGTON, MA 02420
Tel: (781) 676-2962

GSA

Civil Engineers

Job No. 1120		Date: 5/27/12
Drawn By: AG		Scale: AS SHOWN
Rev#	Date:	Description:
1	5/23/13	House
2	3/26/20	House

***Engineering Drainage Calculations
for
105 Lafayette Street
Arlington, Massachusetts***

Prepared by

***Gala Simon Associates, Inc.
394 Lowell Street, Suite 18
Lexington, MA 02420
781-676-2962***

March 26, 2020



Project: 105 Lafayette Street, Arlington, MA

Date: March 26, 2020

Project Narrative:

The site preparation of the project consists of the demolition of the existing dwelling and removal of a shed. The project consists of the construction of a new dwelling in the general vicinity as the existing dwelling. Porous pavement is proposed for the walkway and driveway.

Soils on the site are considered Hydrological Soil Type D per USDA soil maps. On-site soil testing performed by Gala Simon Associates, Inc., on August 15, 2011 indicate sandy loam (group B) on-site.

The 24-hour rainfall amounts used in the hydrological calculations were obtained from the Northeast Regional Climate Center's, "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada".

Summary of Results:

The following table summarizes the peak flows and volumes from the property under Existing and Proposed Conditions.

Summary of Stormwater Runoff and Volume

<i>Storm Event</i>	<i>Existing Conditions Peak</i>		<i>Proposed Conditions Peak</i>		<i>Δ</i>	
	<i>Runoff (cfs)</i>	<i>Volume (af)</i>	<i>Runoff (cfs)</i>	<i>Volume (af)</i>	<i>Runoff (cfs)</i>	<i>Volume (af)</i>
<i>2-Year (3.23 in)</i>	0.20	0.014	0.20	0.014	0.00	0.000
<i>10-Year (4.90 in)</i>	0.49	0.033	0.46	0.031	-0.03	-0.002
<i>25-Year (6.20 in)</i>	0.73	0.049	0.69	0.046	-0.04	-0.003
<i>100-Year (8.89 in)</i>	1.26	0.086	1.18	0.080	-0.08	-0.006

Conclusions:

1. As analyzed, the peak rates of runoff and volumes will be maintained for the 2, 10, 25 and 100 year storm events.

Project: 105 Lafayette Street, Arlington

Date: March 26, 2020

Existing Conditions

Total Area:	8,755 s.f.
Total Impervious Area:	1,641 s.f.
Dirt Road:	406 s.f.
Total Lawn Area:	5,271 s.f.

Hydrocad Model for Existing Conditions:

Total Area:	8,755 s.f.
Impervious:	1,641 s.f.
Dirt Road:	1,843 s.f.
Lawn Area:	5,271 s.f.

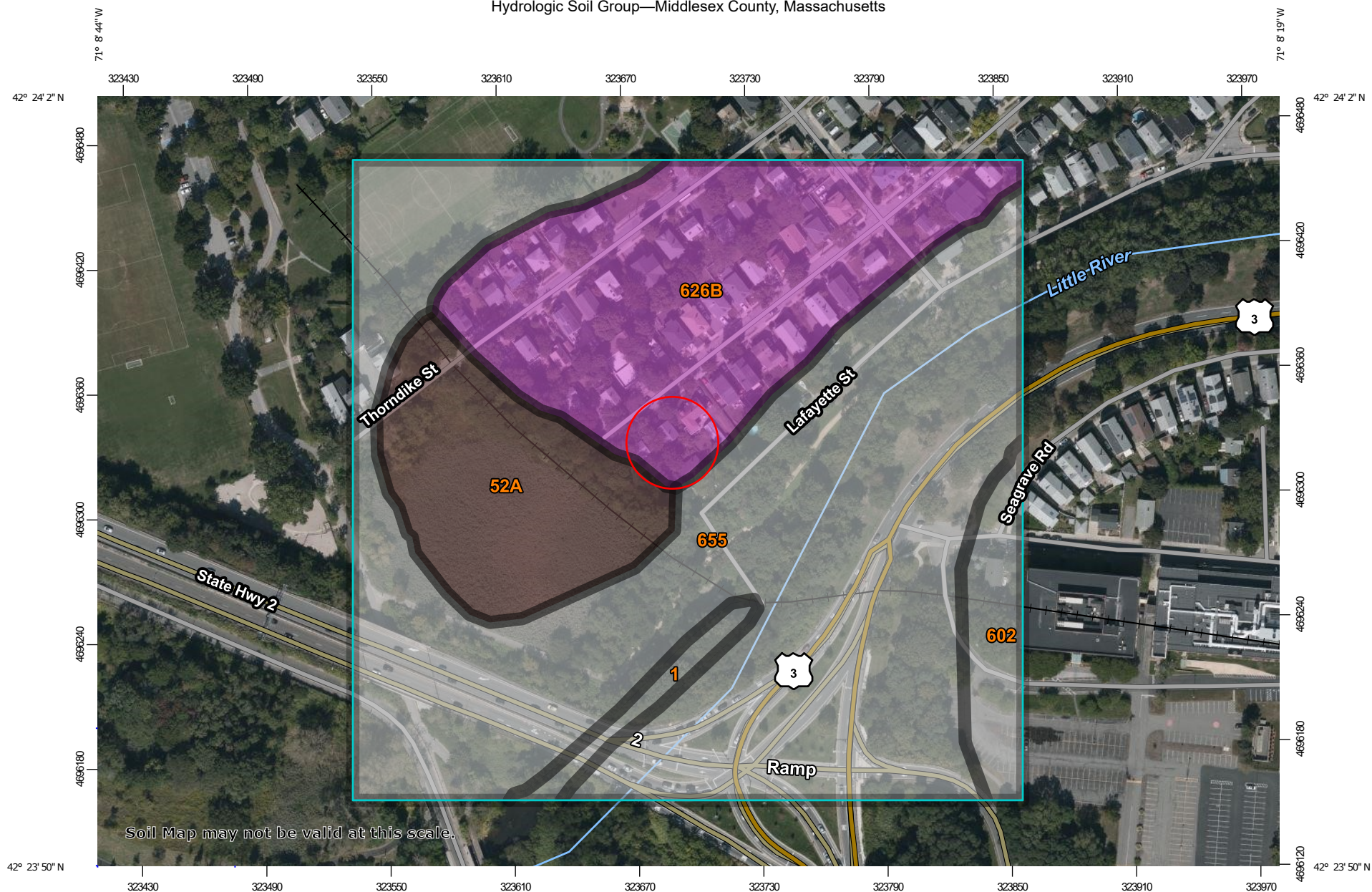
Hydrocad Model for Proposed Conditions

Total Area:	8,755 s.f.
	Impervious: 1,989 s.f.
	Dirt Road: 1,843 s.f.
	Lawn: 4,923 s.f.
Area into Porous Pavers:	765 s.f.
	Impervious: 548 s.f.
	Lawn: 217 s.f.
Remainder of Land:	7,990 s.f.
	Impervious: 1,441 s.f.
	Dirt Road: 1,843 s.f.
	Lawn: 4,706 s.f.

The storm values were compared using the Existing Conditions node and the Proposed Conditions Remainder of Land node.

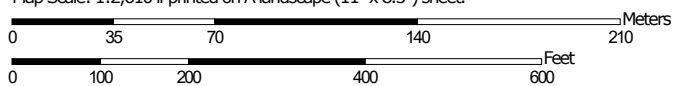
USDA
Soil Mapping

Hydrologic Soil Group—Middlesex County, Massachusetts



Soil Map may not be valid at this scale.

Map Scale: 1:2,610 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey









455 of 637

3/10/2020
Page 1 of 4

MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils**Soil Rating Polygons**





-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available


Soil Rating Lines






-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available


Soil Rating Points

-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available

Water Features
 Streams and Canals
Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background
 Aerial Photography
MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 19, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		0.4	1.8%
52A	Freetown muck, 0 to 1 percent slopes	B/D	3.1	12.5%
602	Urban land		1.0	4.2%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	6.1	24.7%
655	Udorthents, wet substratum		14.0	56.7%
Totals for Area of Interest			24.7	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

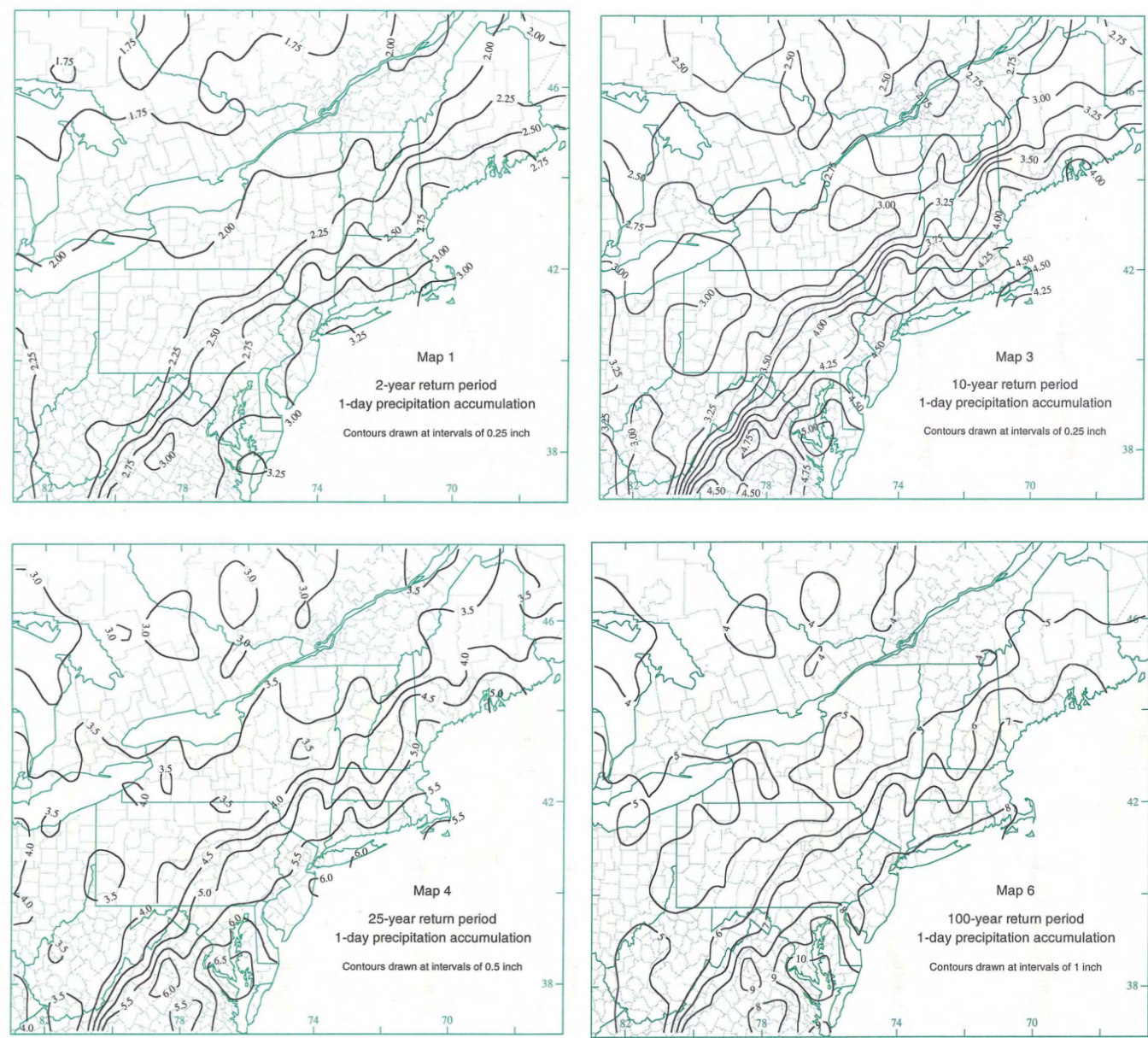
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

*Atlas
of
Precipitation Extremes*

24-hour rainfall amounts obtained from the Northeast Regional Climate Center, “Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada.”

24-Hour Storm Event	Rainfall (inches)
2-year	3.23
10-year	4.90
25-year	6.20
100-year	8.89



Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.142 degrees West
Latitude	42.399 degrees North
Elevation	0 feet
Date/Time	Tue, 10 Mar 2020 11:58:38 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.70	0.87	1.10	1yr	0.75	1.04	1.28	1.63	2.09	2.69	2.94	1yr	2.38	2.83	3.29	3.98	4.65	1yr
2yr	0.35	0.54	0.67	0.88	1.11	1.40	2yr	0.96	1.28	1.62	2.04	2.57	3.23	3.59	2yr	2.86	3.45	3.95	4.70	5.35	2yr
5yr	0.42	0.65	0.81	1.09	1.39	1.78	5yr	1.20	1.61	2.06	2.60	3.26	4.09	4.56	5yr	3.62	4.39	5.00	5.97	6.69	5yr
10yr	0.47	0.74	0.93	1.27	1.65	2.12	10yr	1.43	1.91	2.48	3.12	3.92	4.90	5.47	10yr	4.33	5.26	5.99	7.16	7.92	10yr
25yr	0.56	0.89	1.13	1.56	2.07	2.68	25yr	1.79	2.41	3.14	3.97	4.98	6.20	6.96	25yr	5.49	6.69	7.59	9.10	9.91	25yr
50yr	0.63	1.02	1.30	1.83	2.46	3.22	50yr	2.12	2.86	3.78	4.79	5.99	7.42	8.36	50yr	6.57	8.04	9.09	10.92	11.75	50yr
100yr	0.73	1.18	1.52	2.15	2.93	3.85	100yr	2.53	3.41	4.53	5.74	7.18	8.89	10.04	100yr	7.87	9.65	10.88	13.10	13.93	100yr
200yr	0.84	1.36	1.77	2.53	3.49	4.62	200yr	3.01	4.06	5.44	6.91	8.62	10.65	12.07	200yr	9.42	11.60	13.04	15.73	16.53	200yr
500yr	1.01	1.66	2.17	3.14	4.40	5.86	500yr	3.79	5.11	6.93	8.80	10.98	13.53	15.40	500yr	11.97	14.81	16.57	20.05	20.73	500yr

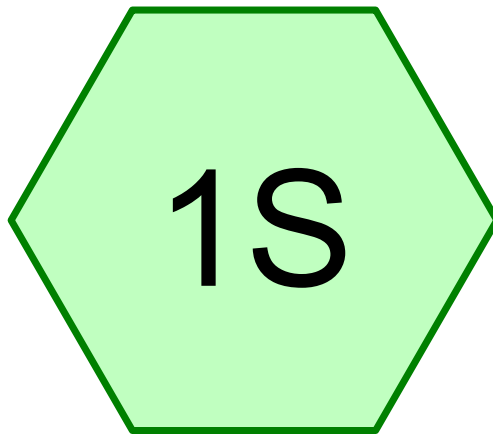
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.38	0.46	0.62	0.76	0.85	1yr	0.66	0.83	1.15	1.44	1.78	2.45	2.51	1yr	2.17	2.42	2.94	3.53	4.09	1yr
2yr	0.33	0.51	0.63	0.85	1.05	1.26	2yr	0.91	1.23	1.45	1.92	2.48	3.13	3.47	2yr	2.77	3.34	3.82	4.54	5.19	2yr
5yr	0.39	0.60	0.75	1.03	1.31	1.51	5yr	1.13	1.48	1.73	2.25	2.89	3.78	4.19	5yr	3.34	4.03	4.59	5.48	6.17	5yr
10yr	0.44	0.67	0.83	1.16	1.50	1.73	10yr	1.30	1.69	1.95	2.53	3.25	4.36	4.84	10yr	3.86	4.65	5.27	6.30	7.01	10yr
25yr	0.51	0.77	0.96	1.37	1.80	2.05	25yr	1.55	2.01	2.31	2.97	3.79	5.24	5.83	25yr	4.64	5.61	6.32	7.54	8.28	25yr
50yr	0.56	0.85	1.06	1.53	2.06	2.36	50yr	1.78	2.30	2.62	3.35	4.25	6.01	6.71	50yr	5.32	6.45	7.23	8.63	9.38	50yr
100yr	0.63	0.95	1.19	1.72	2.36	2.68	100yr	2.04	2.62	2.97	3.62	4.78	6.92	7.71	100yr	6.13	7.41	8.28	9.83	10.63	100yr
200yr	0.71	1.06	1.35	1.95	2.72	3.07	200yr	2.35	3.00	3.37	4.04	5.39	7.95	8.86	200yr	7.04	8.52	9.47	11.18	12.01	200yr
500yr	0.83	1.23	1.59	2.31	3.28	3.66	500yr	2.83	3.58	3.97	4.69	6.31	9.56	10.63	500yr	8.46	10.22	11.31	13.21	14.07	500yr

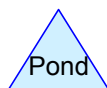
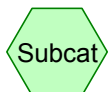
Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.58	0.79	0.97	1.13	1yr	0.83	1.11	1.33	1.77	2.26	2.86	3.17	1yr	2.53	3.05	3.51	4.28	5.03	1yr
2yr	0.36	0.56	0.69	0.94	1.16	1.36	2yr	1.00	1.33	1.57	2.08	2.69	3.35	3.74	2yr	2.97	3.59	4.11	4.88	5.55	2yr
5yr	0.45	0.70	0.87	1.19	1.51	1.79	5yr	1.30	1.75	2.06	2.66	3.39	4.43	4.99	5yr	3.92	4.80	5.42	6.48	7.21	5yr
10yr	0.55	0.84	1.05	1.46	1.89	2.21	10yr	1.63	2.16	2.56	3.23	4.07	5.50	6.24	10yr	4.87	6.00	6.71	8.04	8.82	10yr
25yr	0.71	1.09	1.35	1.93	2.54	2.91	25yr	2.19	2.84	3.41	4.17	5.19	7.30	8.41	25yr	6.46	8.08	8.89	10.74	11.54	25yr
50yr	0.86	1.32	1.64	2.35	3.17	3.60	50yr	2.74	3.52	4.22	5.06	6.24	9.05	10.53	50yr	8.01	10.12	11.00	13.40	14.15	50yr
100yr	1.06	1.60	2.00	2.89	3.97	4.44	100yr	3.42	4.34	5.25	6.40	7.49	11.24	13.21	100yr	9.95	12.70	13.62	16.74	17.39	100yr
200yr	1.29	1.94	2.46	3.56	4.96	5.48	200yr	4.28	5.36	6.52	7.82	8.99	13.96	16.58	200yr	12.36	15.94	16.89	20.93	21.40	200yr
500yr	1.68	2.50	3.22	4.67	6.64	7.23	500yr	5.73	7.07	8.71	10.21	11.46	18.61	22.42	500yr	16.47	21.56	22.44	28.19	28.21	500yr

Existing Conditions
2, 10, 25 and 100 Year Storm Events



Existing Conditions



Drainage Diagram for [1120] Existing Conditions2
Prepared by Gala Simon Associates 3/24/2020
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[1120] Existing Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

Page 1

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3/24/2020

Subcatchment 1S: Existing Conditions

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 0.86"

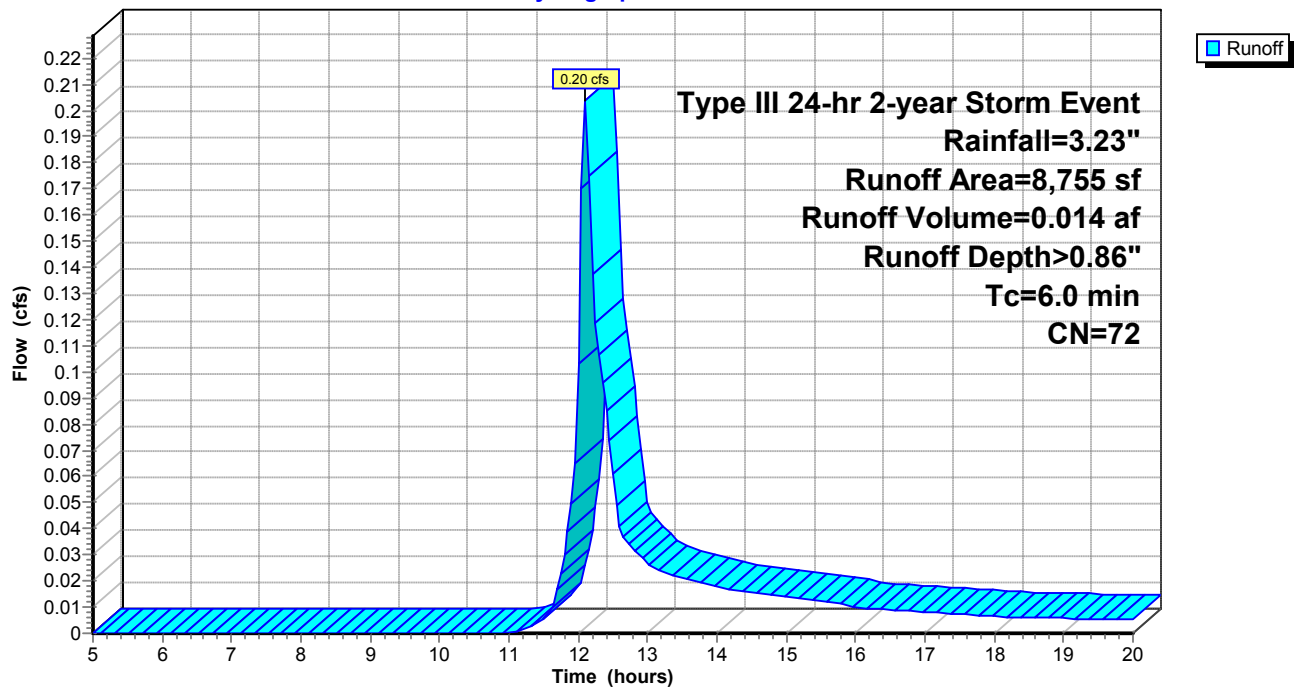
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
1,641	98	Paved parking & roofs
5,271	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
8,755	72	Weighted Average
7,114		Pervious Area
1,641		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

Page 2

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3/24/2020

Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.81	0.01
5.25	0.20	0.00	0.00	18.25	3.01	0.81	0.01
5.50	0.21	0.00	0.00	18.50	3.02	0.82	0.01
5.75	0.22	0.00	0.00	18.75	3.03	0.83	0.01
6.00	0.23	0.00	0.00	19.00	3.05	0.84	0.01
6.25	0.25	0.00	0.00	19.25	3.06	0.84	0.01
6.50	0.26	0.00	0.00	19.50	3.07	0.85	0.01
6.75	0.28	0.00	0.00	19.75	3.08	0.86	0.01
7.00	0.29	0.00	0.00	20.00	3.09	0.86	0.01
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.01	0.01				
11.75	1.15	0.03	0.02				
12.00	1.61	0.15	0.10				
12.25	2.08	0.33	0.12				
12.50	2.27	0.41	0.06				
12.75	2.35	0.45	0.03				
13.00	2.42	0.49	0.03				
13.25	2.48	0.52	0.02				
13.50	2.53	0.54	0.02				
13.75	2.58	0.57	0.02				
14.00	2.62	0.59	0.02				
14.25	2.66	0.61	0.02				
14.50	2.69	0.63	0.02				
14.75	2.73	0.65	0.02				
15.00	2.76	0.67	0.01				
15.25	2.79	0.69	0.01				
15.50	2.82	0.70	0.01				
15.75	2.84	0.71	0.01				
16.00	2.86	0.73	0.01				
16.25	2.88	0.74	0.01				
16.50	2.90	0.75	0.01				
16.75	2.92	0.76	0.01				
17.00	2.94	0.77	0.01				
17.25	2.95	0.78	0.01				
17.50	2.97	0.79	0.01				
17.75	2.98	0.80	0.01				

[1120] Existing Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

Prepared by Gala Simon Associates

Page 3

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3/24/2020

Subcatchment 1S: Existing Conditions

Runoff = 0.49 cfs @ 12.10 hrs, Volume= 0.033 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

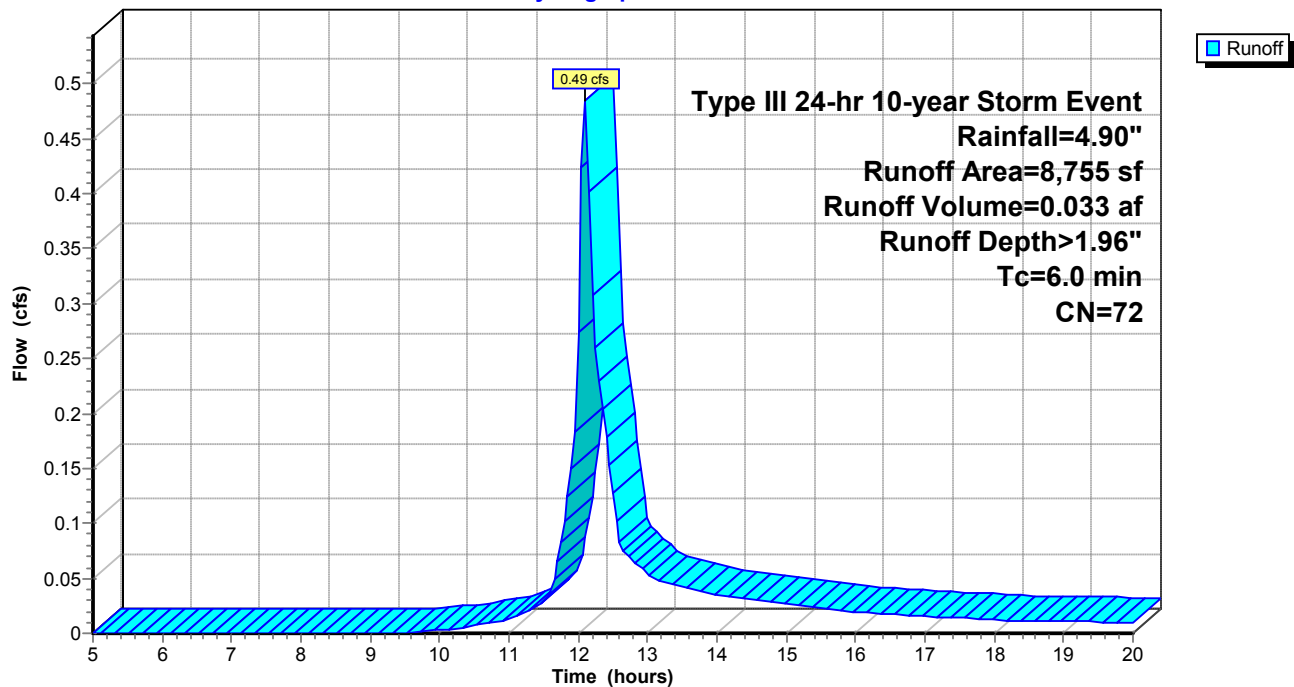
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
1,641	98	Paved parking & roofs
5,271	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
8,755	72	Weighted Average
7,114		Pervious Area
1,641		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	1.86	0.01
5.25	0.30	0.00	0.00	18.25	4.57	1.87	0.01
5.50	0.31	0.00	0.00	18.50	4.59	1.88	0.01
5.75	0.33	0.00	0.00	18.75	4.60	1.90	0.01
6.00	0.35	0.00	0.00	19.00	4.62	1.91	0.01
6.25	0.37	0.00	0.00	19.25	4.64	1.92	0.01
6.50	0.40	0.00	0.00	19.50	4.66	1.94	0.01
6.75	0.42	0.00	0.00	19.75	4.67	1.95	0.01
7.00	0.44	0.00	0.00	20.00	4.69	1.96	0.01
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.01	0.00				
10.25	0.99	0.01	0.00				
10.50	1.06	0.02	0.01				
10.75	1.14	0.03	0.01				
11.00	1.22	0.05	0.01				
11.25	1.33	0.07	0.02				
11.50	1.46	0.10	0.03				
11.75	1.74	0.19	0.08				
12.00	2.45	0.50	0.27				
12.25	3.16	0.90	0.26				
12.50	3.44	1.08	0.13				
12.75	3.57	1.17	0.07				
13.00	3.67	1.24	0.05				
13.25	3.76	1.29	0.05				
13.50	3.84	1.35	0.04				
13.75	3.91	1.40	0.04				
14.00	3.97	1.44	0.04				
14.25	4.03	1.48	0.03				
14.50	4.09	1.52	0.03				
14.75	4.14	1.56	0.03				
15.00	4.19	1.59	0.03				
15.25	4.23	1.62	0.03				
15.50	4.27	1.65	0.02				
15.75	4.31	1.68	0.02				
16.00	4.34	1.70	0.02				
16.25	4.37	1.73	0.02				
16.50	4.40	1.75	0.02				
16.75	4.43	1.77	0.02				
17.00	4.46	1.79	0.02				
17.25	4.48	1.81	0.01				
17.50	4.50	1.82	0.01				
17.75	4.53	1.84	0.01				

[1120] Existing Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 1S: Existing Conditions

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 0.049 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

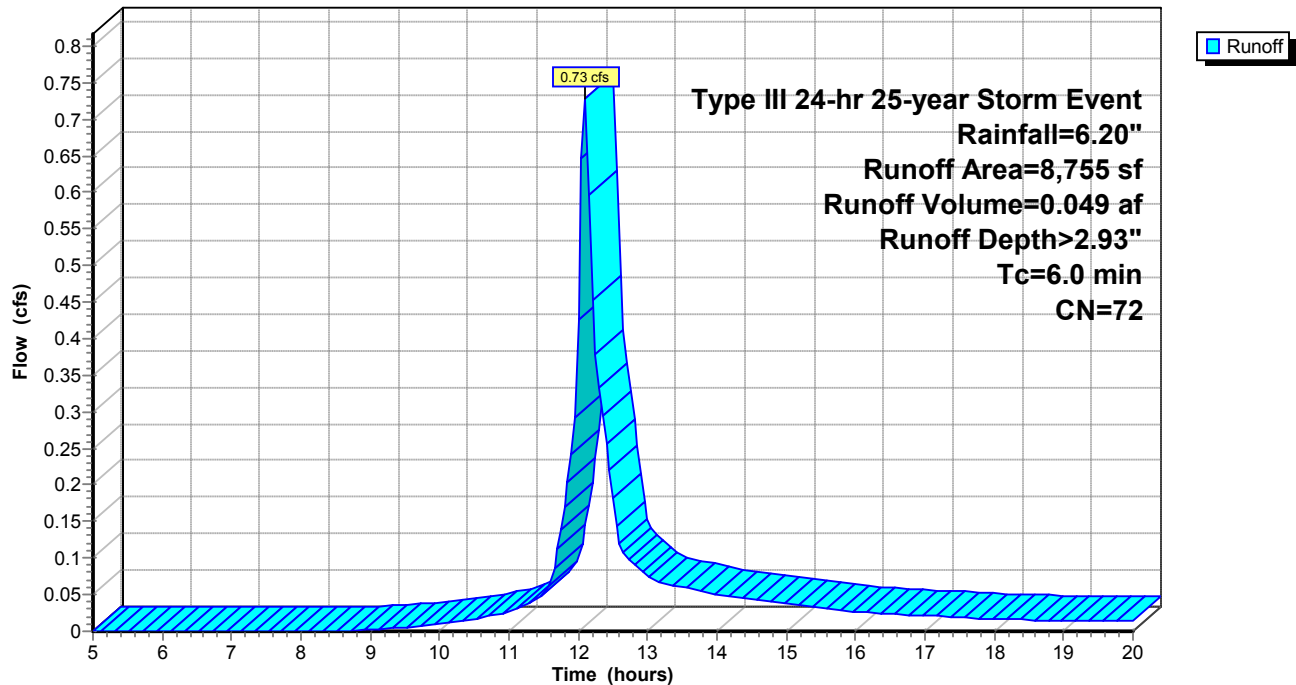
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
1,641	98	Paved parking & roofs
5,271	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
8,755	72	Weighted Average
7,114		Pervious Area
1,641		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	2.79	0.02
5.25	0.37	0.00	0.00	18.25	5.78	2.81	0.02
5.50	0.40	0.00	0.00	18.50	5.80	2.83	0.02
5.75	0.42	0.00	0.00	18.75	5.83	2.85	0.02
6.00	0.45	0.00	0.00	19.00	5.85	2.87	0.01
6.25	0.47	0.00	0.00	19.25	5.87	2.89	0.01
6.50	0.50	0.00	0.00	19.50	5.89	2.91	0.01
6.75	0.53	0.00	0.00	19.75	5.91	2.92	0.01
7.00	0.56	0.00	0.00	20.00	5.93	2.94	0.01
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.01	0.00				
9.50	1.03	0.02	0.01				
9.75	1.10	0.02	0.01				
10.00	1.17	0.04	0.01				
10.25	1.25	0.05	0.01				
10.50	1.34	0.07	0.02				
10.75	1.44	0.10	0.02				
11.00	1.55	0.13	0.03				
11.25	1.68	0.17	0.04				
11.50	1.85	0.23	0.05				
11.75	2.20	0.38	0.14				
12.00	3.10	0.87	0.43				
12.25	4.00	1.46	0.38				
12.50	4.35	1.71	0.18				
12.75	4.52	1.83	0.10				
13.00	4.65	1.93	0.08				
13.25	4.76	2.01	0.07				
13.50	4.86	2.09	0.06				
13.75	4.95	2.16	0.06				
14.00	5.03	2.22	0.05				
14.25	5.10	2.28	0.05				
14.50	5.17	2.33	0.04				
14.75	5.24	2.38	0.04				
15.00	5.30	2.43	0.04				
15.25	5.35	2.47	0.04				
15.50	5.40	2.51	0.03				
15.75	5.45	2.55	0.03				
16.00	5.49	2.58	0.03				
16.25	5.53	2.62	0.03				
16.50	5.57	2.65	0.02				
16.75	5.61	2.67	0.02				
17.00	5.64	2.70	0.02				
17.25	5.67	2.73	0.02				
17.50	5.70	2.75	0.02				
17.75	5.73	2.77	0.02				

[1120] Existing Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

Prepared by Gala Simon Associates

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Subcatchment 1S: Existing Conditions

Runoff = 1.26 cfs @ 12.09 hrs, Volume= 0.086 af, Depth> 5.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

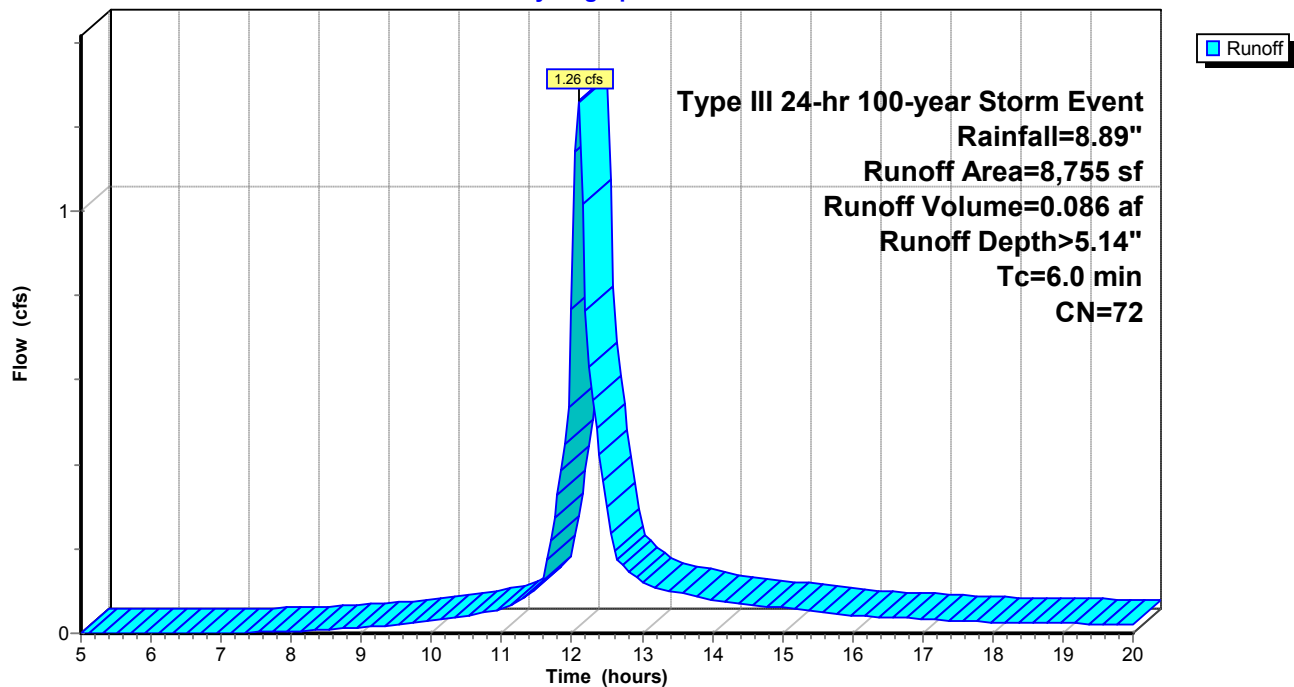
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
1,641	98	Paved parking & roofs
5,271	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
8,755	72	Weighted Average
7,114		Pervious Area
1,641		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

Prepared by Gala Simon Associates

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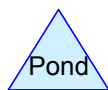
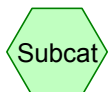
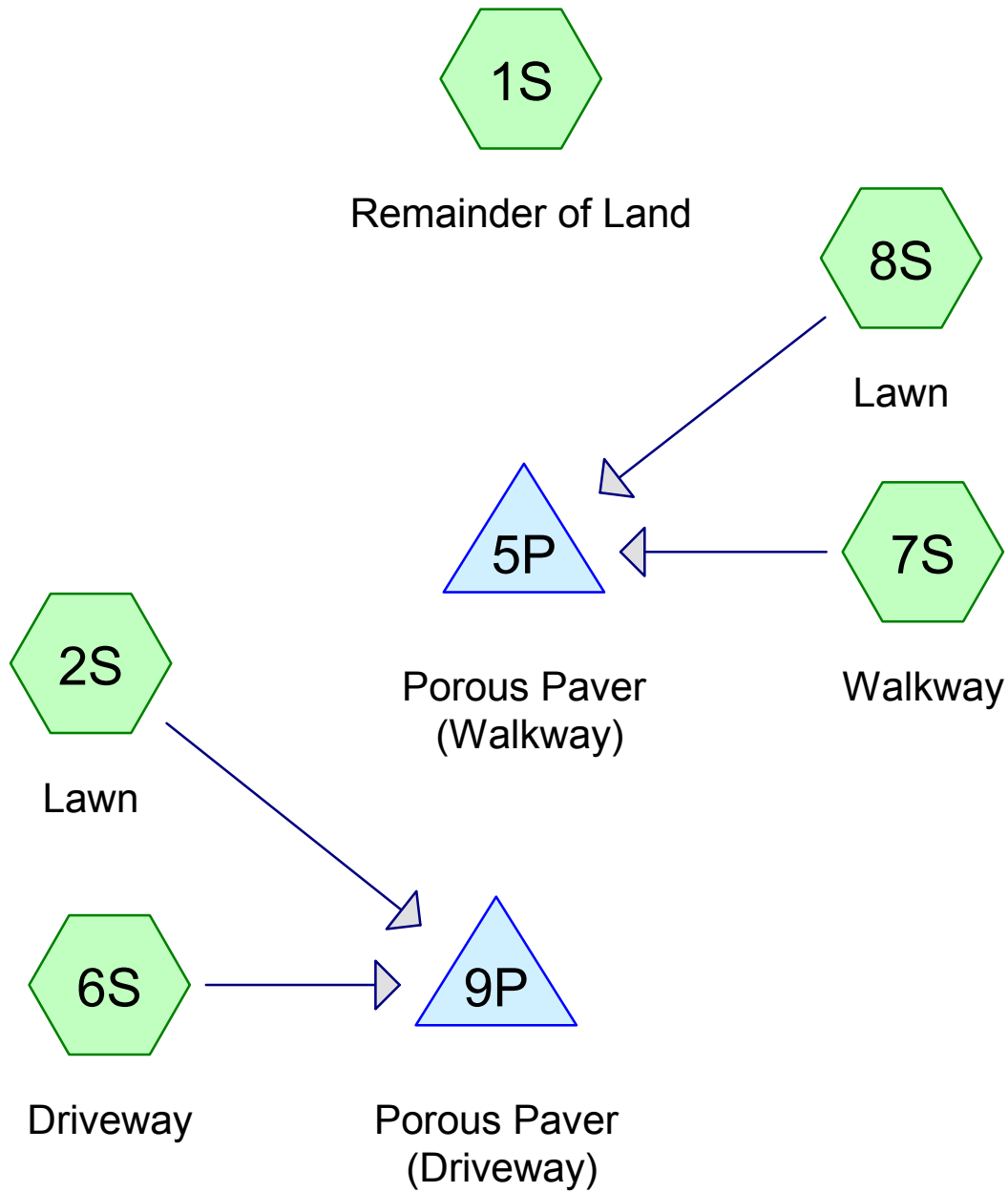
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Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	4.91	0.03
5.25	0.54	0.00	0.00	18.25	8.29	4.95	0.03
5.50	0.57	0.00	0.00	18.50	8.32	4.98	0.02
5.75	0.60	0.00	0.00	18.75	8.35	5.01	0.02
6.00	0.64	0.00	0.00	19.00	8.39	5.03	0.02
6.25	0.68	0.00	0.00	19.25	8.42	5.06	0.02
6.50	0.72	0.00	0.00	19.50	8.45	5.09	0.02
6.75	0.76	0.00	0.00	19.75	8.48	5.12	0.02
7.00	0.80	0.00	0.00	20.00	8.51	5.14	0.02
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.01	0.00				
8.00	1.01	0.01	0.00				
8.25	1.07	0.02	0.01				
8.50	1.14	0.03	0.01				
8.75	1.22	0.04	0.01				
9.00	1.30	0.06	0.01				
9.25	1.38	0.08	0.02				
9.50	1.48	0.11	0.02				
9.75	1.57	0.14	0.02				
10.00	1.68	0.17	0.03				
10.25	1.80	0.21	0.03				
10.50	1.92	0.26	0.04				
10.75	2.07	0.32	0.05				
11.00	2.22	0.39	0.06				
11.25	2.41	0.48	0.08				
11.50	2.65	0.61	0.11				
11.75	3.16	0.90	0.27				
12.00	4.44	1.78	0.77				
12.25	5.73	2.78	0.63				
12.50	6.24	3.19	0.30				
12.75	6.48	3.39	0.16				
13.00	6.67	3.55	0.12				
13.25	6.82	3.68	0.11				
13.50	6.97	3.80	0.10				
13.75	7.09	3.91	0.09				
14.00	7.21	4.01	0.08				
14.25	7.32	4.10	0.07				
14.50	7.41	4.18	0.07				
14.75	7.51	4.27	0.06				
15.00	7.59	4.34	0.06				
15.25	7.67	4.41	0.06				
15.50	7.75	4.47	0.05				
15.75	7.82	4.53	0.05				
16.00	7.88	4.59	0.04				
16.25	7.93	4.64	0.04				
16.50	7.99	4.68	0.04				
16.75	8.04	4.73	0.04				
17.00	8.09	4.77	0.03				
17.25	8.13	4.81	0.03				
17.50	8.17	4.85	0.03				
17.75	8.21	4.88	0.03				

***Proposed Conditions
2, 10, 25 and 100 Year Storm Events***



Drainage Diagram for [1120] Proposed Conditions2
 Prepared by Gala Simon Associates 3/26/2020
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[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Subcatchment 1S: Remainder of Land

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

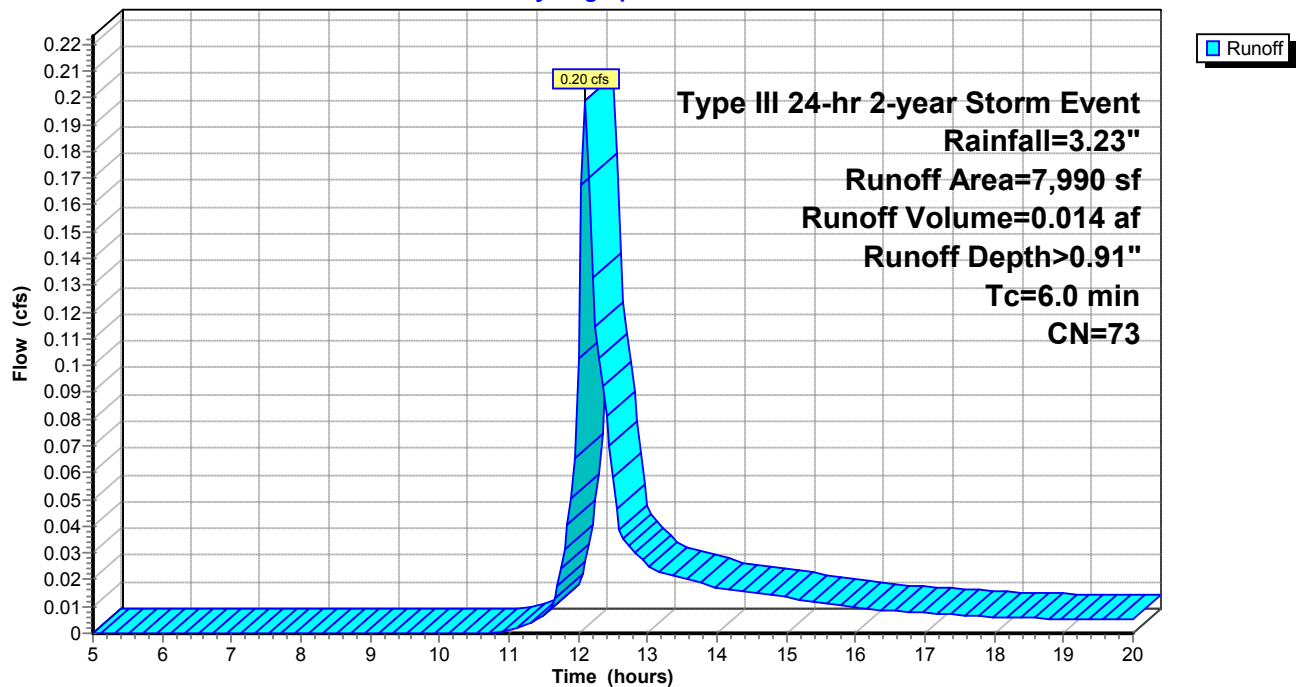
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
1,441	98	Paved parking & roofs
4,706	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
7,990	73	Weighted Average
6,549		Pervious Area
1,441		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.86	0.01
5.25	0.20	0.00	0.00	18.25	3.01	0.86	0.01
5.50	0.21	0.00	0.00	18.50	3.02	0.87	0.01
5.75	0.22	0.00	0.00	18.75	3.03	0.88	0.01
6.00	0.23	0.00	0.00	19.00	3.05	0.89	0.01
6.25	0.25	0.00	0.00	19.25	3.06	0.89	0.01
6.50	0.26	0.00	0.00	19.50	3.07	0.90	0.01
6.75	0.28	0.00	0.00	19.75	3.08	0.91	0.01
7.00	0.29	0.00	0.00	20.00	3.09	0.91	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.01	0.01				
11.75	1.15	0.04	0.02				
12.00	1.61	0.17	0.10				
12.25	2.08	0.36	0.11				
12.50	2.27	0.45	0.06				
12.75	2.35	0.49	0.03				
13.00	2.42	0.53	0.03				
13.25	2.48	0.56	0.02				
13.50	2.53	0.58	0.02				
13.75	2.58	0.61	0.02				
14.00	2.62	0.63	0.02				
14.25	2.66	0.66	0.02				
14.50	2.69	0.68	0.02				
14.75	2.73	0.70	0.01				
15.00	2.76	0.71	0.01				
15.25	2.79	0.73	0.01				
15.50	2.82	0.75	0.01				
15.75	2.84	0.76	0.01				
16.00	2.86	0.77	0.01				
16.25	2.88	0.79	0.01				
16.50	2.90	0.80	0.01				
16.75	2.92	0.81	0.01				
17.00	2.94	0.82	0.01				
17.25	2.95	0.83	0.01				
17.50	2.97	0.84	0.01				
17.75	2.98	0.85	0.01				

[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

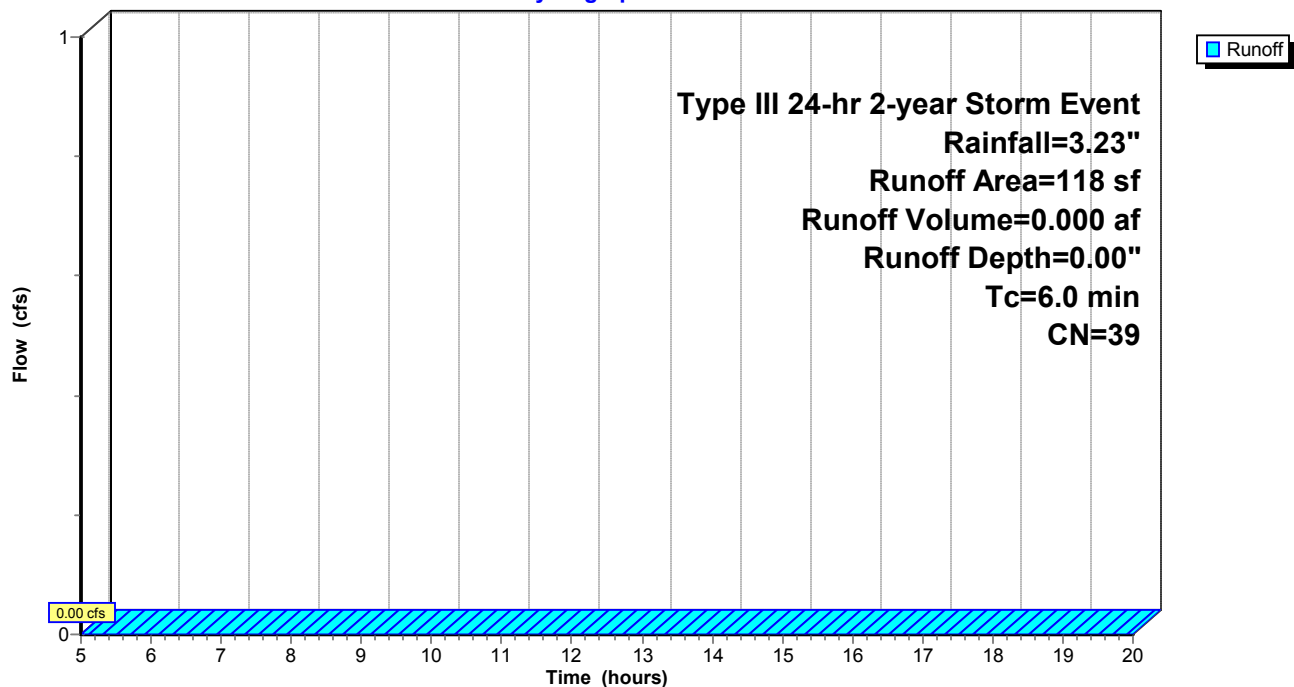
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
118	39	>75% Grass cover, Good, HSG A
118		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.00	0.00
5.25	0.20	0.00	0.00	18.25	3.01	0.00	0.00
5.50	0.21	0.00	0.00	18.50	3.02	0.00	0.00
5.75	0.22	0.00	0.00	18.75	3.03	0.00	0.00
6.00	0.23	0.00	0.00	19.00	3.05	0.00	0.00
6.25	0.25	0.00	0.00	19.25	3.06	0.00	0.00
6.50	0.26	0.00	0.00	19.50	3.07	0.00	0.00
6.75	0.28	0.00	0.00	19.75	3.08	0.00	0.00
7.00	0.29	0.00	0.00	20.00	3.09	0.00	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.00	0.00				
11.75	1.15	0.00	0.00				
12.00	1.61	0.00	0.00				
12.25	2.08	0.00	0.00				
12.50	2.27	0.00	0.00				
12.75	2.35	0.00	0.00				
13.00	2.42	0.00	0.00				
13.25	2.48	0.00	0.00				
13.50	2.53	0.00	0.00				
13.75	2.58	0.00	0.00				
14.00	2.62	0.00	0.00				
14.25	2.66	0.00	0.00				
14.50	2.69	0.00	0.00				
14.75	2.73	0.00	0.00				
15.00	2.76	0.00	0.00				
15.25	2.79	0.00	0.00				
15.50	2.82	0.00	0.00				
15.75	2.84	0.00	0.00				
16.00	2.86	0.00	0.00				
16.25	2.88	0.00	0.00				
16.50	2.90	0.00	0.00				
16.75	2.92	0.00	0.00				
17.00	2.94	0.00	0.00				
17.25	2.95	0.00	0.00				
17.50	2.97	0.00	0.00				
17.75	2.98	0.00	0.00				

[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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3/26/2020

Subcatchment 6S: Driveway

Runoff = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

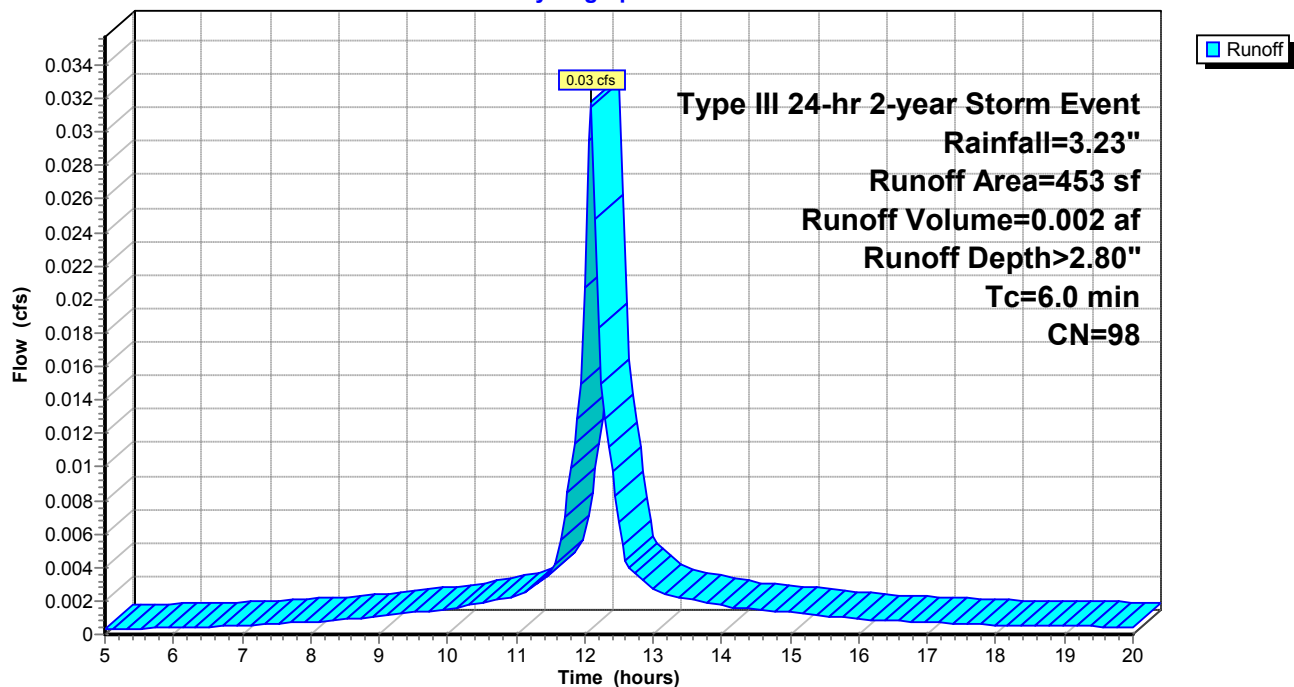
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
453	98	Paved parking & roofs
453		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Driveway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 6S: Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.06	0.00	18.00	3.00	2.77	0.00
5.25	0.20	0.07	0.00	18.25	3.01	2.78	0.00
5.50	0.21	0.07	0.00	18.50	3.02	2.79	0.00
5.75	0.22	0.08	0.00	18.75	3.03	2.80	0.00
6.00	0.23	0.09	0.00	19.00	3.05	2.81	0.00
6.25	0.25	0.10	0.00	19.25	3.06	2.83	0.00
6.50	0.26	0.11	0.00	19.50	3.07	2.84	0.00
6.75	0.28	0.13	0.00	19.75	3.08	2.85	0.00
7.00	0.29	0.14	0.00	20.00	3.09	2.86	0.00
7.25	0.31	0.15	0.00				
7.50	0.33	0.17	0.00				
7.75	0.35	0.18	0.00				
8.00	0.37	0.20	0.00				
8.25	0.39	0.22	0.00				
8.50	0.41	0.24	0.00				
8.75	0.44	0.27	0.00				
9.00	0.47	0.29	0.00				
9.25	0.50	0.32	0.00				
9.50	0.54	0.35	0.00				
9.75	0.57	0.38	0.00				
10.00	0.61	0.42	0.00				
10.25	0.65	0.46	0.00				
10.50	0.70	0.50	0.00				
10.75	0.75	0.55	0.00				
11.00	0.81	0.61	0.00				
11.25	0.88	0.67	0.00				
11.50	0.96	0.75	0.00				
11.75	1.15	0.93	0.01				
12.00	1.61	1.39	0.02				
12.25	2.08	1.86	0.01				
12.50	2.27	2.04	0.01				
12.75	2.35	2.13	0.00				
13.00	2.42	2.19	0.00				
13.25	2.48	2.25	0.00				
13.50	2.53	2.30	0.00				
13.75	2.58	2.35	0.00				
14.00	2.62	2.39	0.00				
14.25	2.66	2.43	0.00				
14.50	2.69	2.46	0.00				
14.75	2.73	2.50	0.00				
15.00	2.76	2.53	0.00				
15.25	2.79	2.56	0.00				
15.50	2.82	2.58	0.00				
15.75	2.84	2.61	0.00				
16.00	2.86	2.63	0.00				
16.25	2.88	2.65	0.00				
16.50	2.90	2.67	0.00				
16.75	2.92	2.69	0.00				
17.00	2.94	2.71	0.00				
17.25	2.95	2.72	0.00				
17.50	2.97	2.74	0.00				
17.75	2.98	2.75	0.00				

[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Subcatchment 7S: Walkway

Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

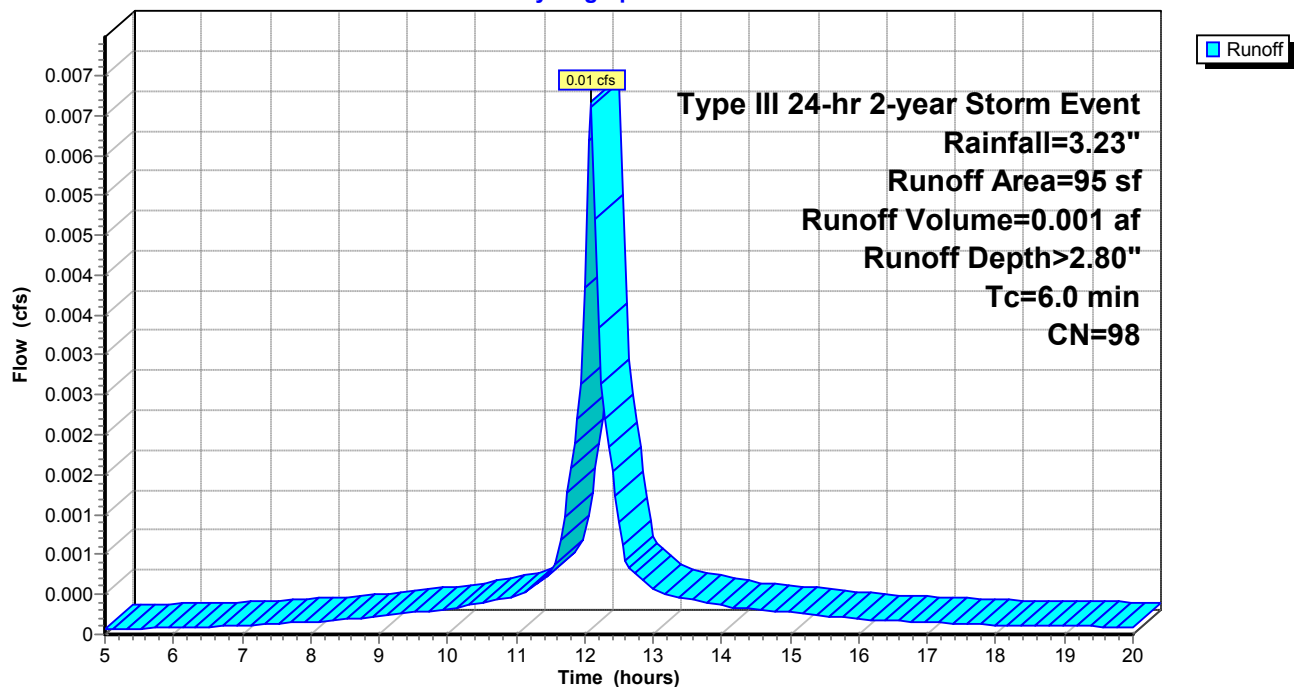
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
95	98	Paved parking & roofs
95		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.06	0.00	18.00	3.00	2.77	0.00
5.25	0.20	0.07	0.00	18.25	3.01	2.78	0.00
5.50	0.21	0.07	0.00	18.50	3.02	2.79	0.00
5.75	0.22	0.08	0.00	18.75	3.03	2.80	0.00
6.00	0.23	0.09	0.00	19.00	3.05	2.81	0.00
6.25	0.25	0.10	0.00	19.25	3.06	2.83	0.00
6.50	0.26	0.11	0.00	19.50	3.07	2.84	0.00
6.75	0.28	0.13	0.00	19.75	3.08	2.85	0.00
7.00	0.29	0.14	0.00	20.00	3.09	2.86	0.00
7.25	0.31	0.15	0.00				
7.50	0.33	0.17	0.00				
7.75	0.35	0.18	0.00				
8.00	0.37	0.20	0.00				
8.25	0.39	0.22	0.00				
8.50	0.41	0.24	0.00				
8.75	0.44	0.27	0.00				
9.00	0.47	0.29	0.00				
9.25	0.50	0.32	0.00				
9.50	0.54	0.35	0.00				
9.75	0.57	0.38	0.00				
10.00	0.61	0.42	0.00				
10.25	0.65	0.46	0.00				
10.50	0.70	0.50	0.00				
10.75	0.75	0.55	0.00				
11.00	0.81	0.61	0.00				
11.25	0.88	0.67	0.00				
11.50	0.96	0.75	0.00				
11.75	1.15	0.93	0.00				
12.00	1.61	1.39	0.00				
12.25	2.08	1.86	0.00				
12.50	2.27	2.04	0.00				
12.75	2.35	2.13	0.00				
13.00	2.42	2.19	0.00				
13.25	2.48	2.25	0.00				
13.50	2.53	2.30	0.00				
13.75	2.58	2.35	0.00				
14.00	2.62	2.39	0.00				
14.25	2.66	2.43	0.00				
14.50	2.69	2.46	0.00				
14.75	2.73	2.50	0.00				
15.00	2.76	2.53	0.00				
15.25	2.79	2.56	0.00				
15.50	2.82	2.58	0.00				
15.75	2.84	2.61	0.00				
16.00	2.86	2.63	0.00				
16.25	2.88	2.65	0.00				
16.50	2.90	2.67	0.00				
16.75	2.92	2.69	0.00				
17.00	2.94	2.71	0.00				
17.25	2.95	2.72	0.00				
17.50	2.97	2.74	0.00				
17.75	2.98	2.75	0.00				

[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

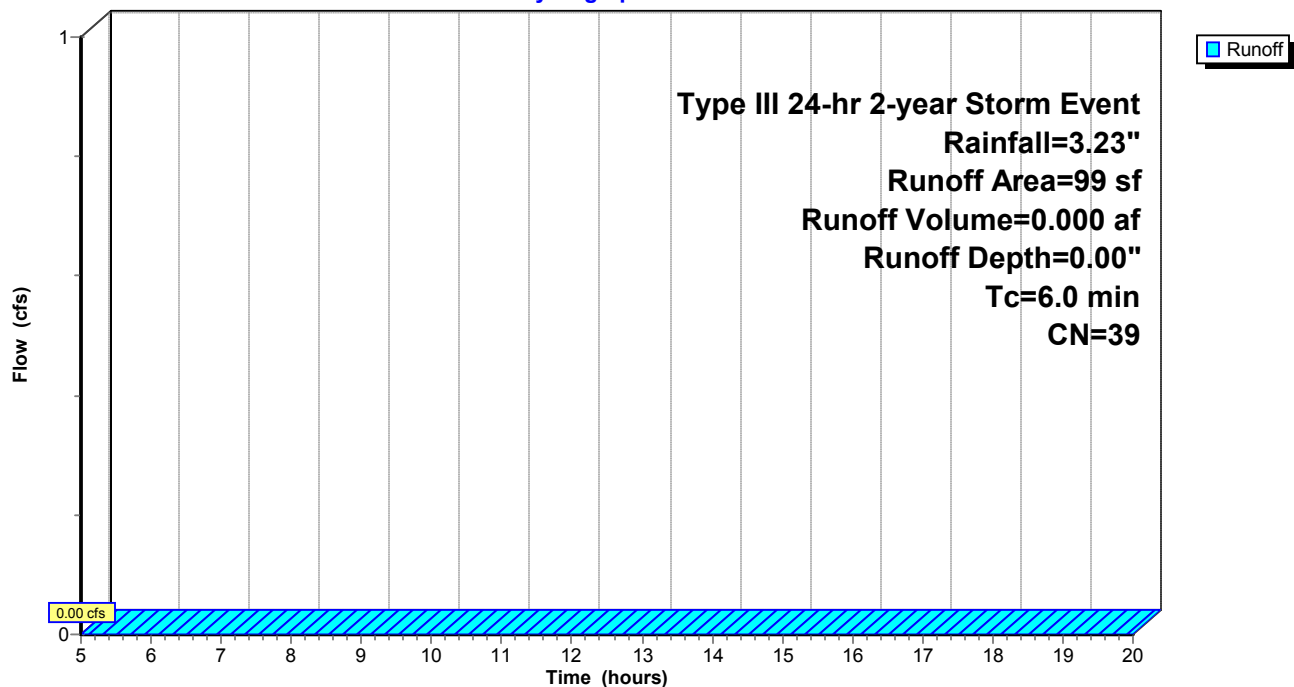
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.00	0.00
5.25	0.20	0.00	0.00	18.25	3.01	0.00	0.00
5.50	0.21	0.00	0.00	18.50	3.02	0.00	0.00
5.75	0.22	0.00	0.00	18.75	3.03	0.00	0.00
6.00	0.23	0.00	0.00	19.00	3.05	0.00	0.00
6.25	0.25	0.00	0.00	19.25	3.06	0.00	0.00
6.50	0.26	0.00	0.00	19.50	3.07	0.00	0.00
6.75	0.28	0.00	0.00	19.75	3.08	0.00	0.00
7.00	0.29	0.00	0.00	20.00	3.09	0.00	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.00	0.00				
11.75	1.15	0.00	0.00				
12.00	1.61	0.00	0.00				
12.25	2.08	0.00	0.00				
12.50	2.27	0.00	0.00				
12.75	2.35	0.00	0.00				
13.00	2.42	0.00	0.00				
13.25	2.48	0.00	0.00				
13.50	2.53	0.00	0.00				
13.75	2.58	0.00	0.00				
14.00	2.62	0.00	0.00				
14.25	2.66	0.00	0.00				
14.50	2.69	0.00	0.00				
14.75	2.73	0.00	0.00				
15.00	2.76	0.00	0.00				
15.25	2.79	0.00	0.00				
15.50	2.82	0.00	0.00				
15.75	2.84	0.00	0.00				
16.00	2.86	0.00	0.00				
16.25	2.88	0.00	0.00				
16.50	2.90	0.00	0.00				
16.75	2.92	0.00	0.00				
17.00	2.94	0.00	0.00				
17.25	2.95	0.00	0.00				
17.50	2.97	0.00	0.00				
17.75	2.98	0.00	0.00				

[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 1.37" for 2-year Storm Event event
 Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 12.05 hrs, Volume= 0.001 af, Atten= 25%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 12.05 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.28' @ 12.16 hrs Surf.Area= 0 sf Storage= 1 cf

Plug-Flow detention time= 1.4 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 1.1 min (739.6 - 738.5)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	16 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	16

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 12.05 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions2

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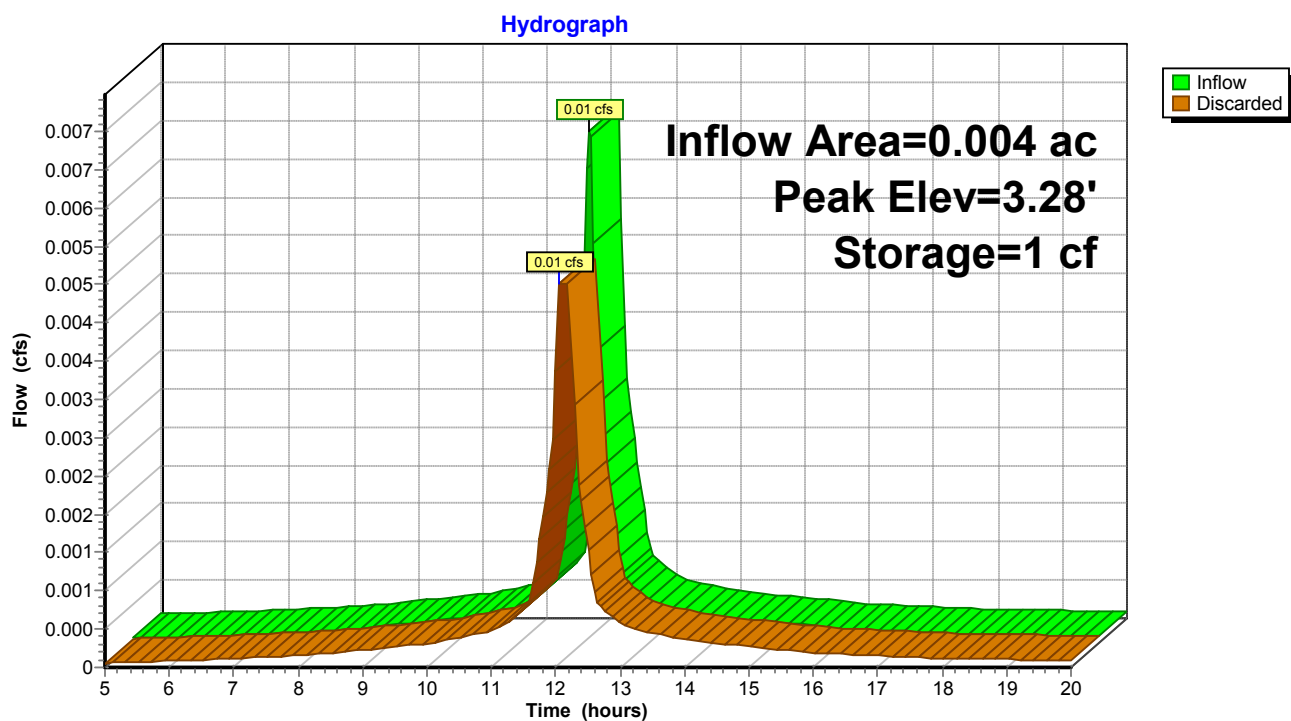
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Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions2*Type III 24-hr 2-year Storm Event Rainfall=3.23"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.00	0	3.25	0.00
12.00	0.00	0	3.26	0.00
12.50	0.00	0	3.25	0.00
13.00	0.00	0	3.25	0.00
13.50	0.00	0	3.25	0.00
14.00	0.00	0	3.25	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.013 ac, Inflow Depth > 2.22" for 2-year Storm Event event
 Inflow = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af
 Outflow = 0.03 cfs @ 12.05 hrs, Volume= 0.002 af, Atten= 22%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 12.05 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.27' @ 12.15 hrs Surf.Area= 0 sf Storage= 3 cf

Plug-Flow detention time= 1.2 min calculated for 0.002 af (100% of inflow)
 Center-of-Mass det. time= 1.0 min (739.5 - 738.5)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	75 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	75

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 12.05 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions2

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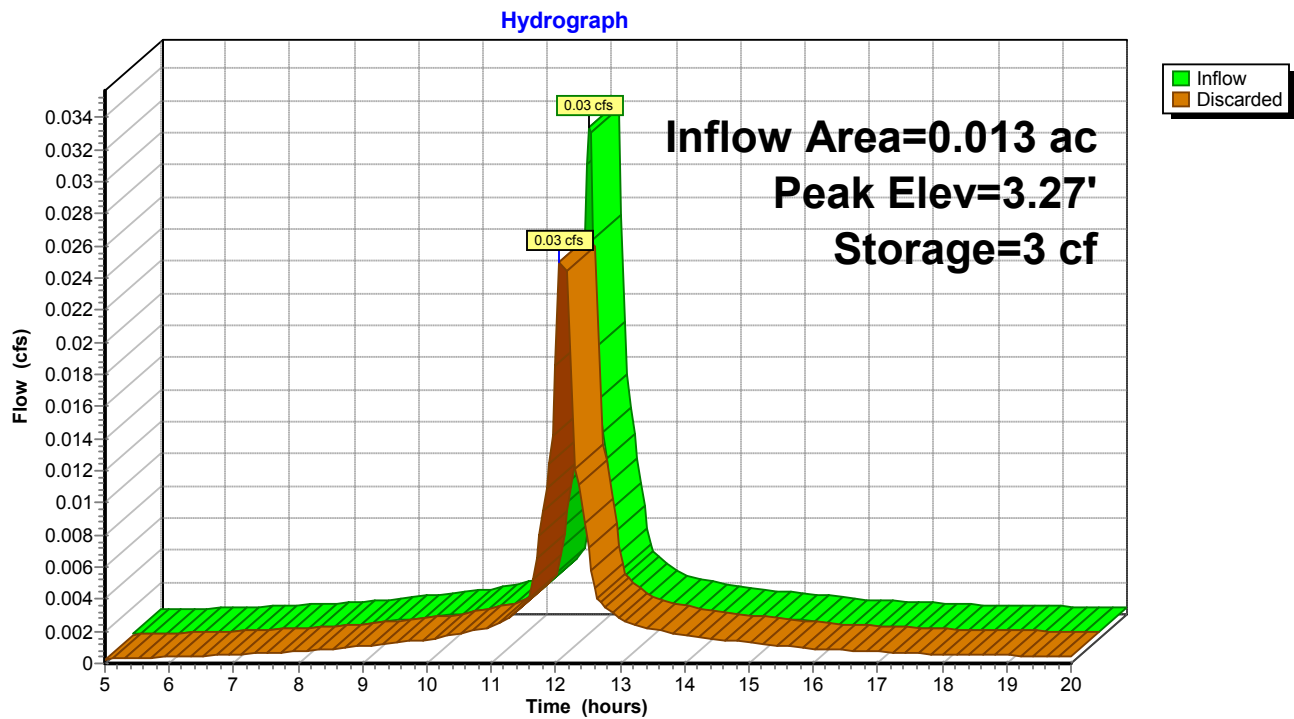
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Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions2*Type III 24-hr 2-year Storm Event Rainfall=3.23"*

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.00	0	3.25	0.00
12.00	0.02	1	3.26	0.02
12.50	0.01	0	3.25	0.01
13.00	0.00	0	3.25	0.00
13.50	0.00	0	3.25	0.00
14.00	0.00	0	3.25	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 1S: Remainder of Land

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.031 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

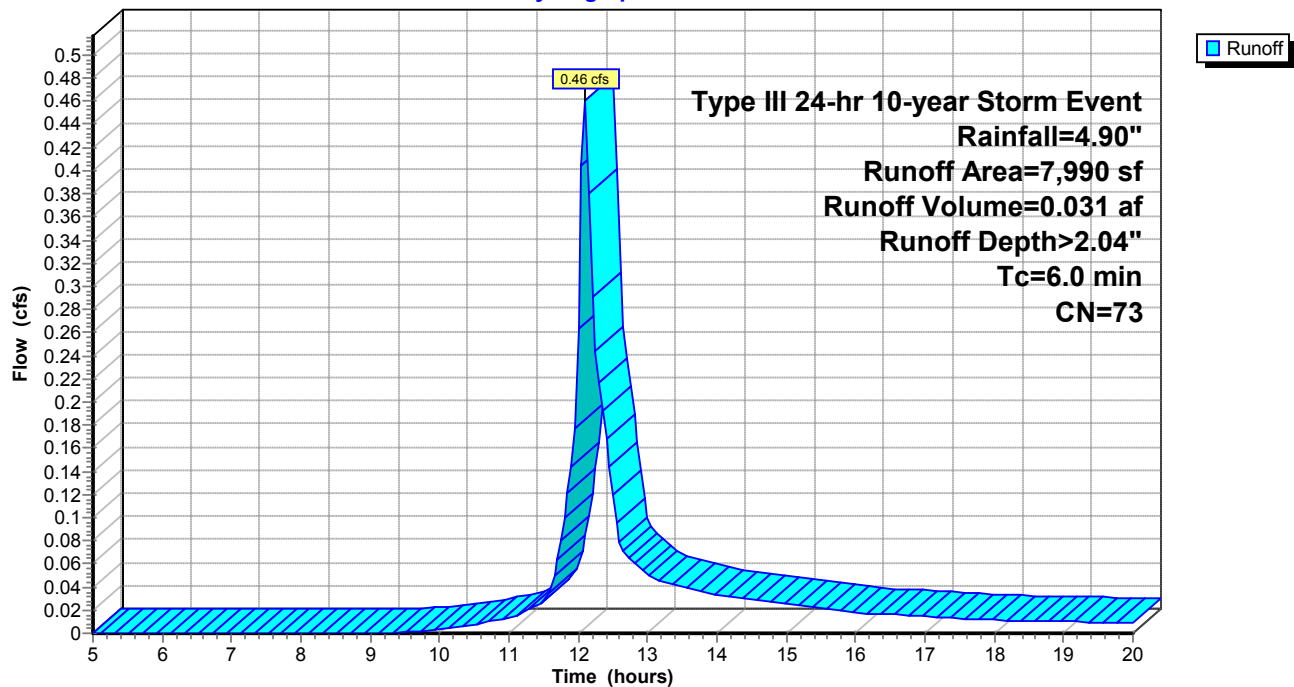
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
1,441	98	Paved parking & roofs
4,706	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
7,990	73	Weighted Average
6,549		Pervious Area
1,441		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	1.93	0.01
5.25	0.30	0.00	0.00	18.25	4.57	1.95	0.01
5.50	0.31	0.00	0.00	18.50	4.59	1.96	0.01
5.75	0.33	0.00	0.00	18.75	4.60	1.97	0.01
6.00	0.35	0.00	0.00	19.00	4.62	1.99	0.01
6.25	0.37	0.00	0.00	19.25	4.64	2.00	0.01
6.50	0.40	0.00	0.00	19.50	4.66	2.01	0.01
6.75	0.42	0.00	0.00	19.75	4.67	2.03	0.01
7.00	0.44	0.00	0.00	20.00	4.69	2.04	0.01
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.01	0.00				
10.25	0.99	0.02	0.01				
10.50	1.06	0.03	0.01				
10.75	1.14	0.04	0.01				
11.00	1.22	0.06	0.01				
11.25	1.33	0.08	0.02				
11.50	1.46	0.12	0.03				
11.75	1.74	0.21	0.08				
12.00	2.45	0.54	0.26				
12.25	3.16	0.96	0.24				
12.50	3.44	1.14	0.12				
12.75	3.57	1.23	0.06				
13.00	3.67	1.30	0.05				
13.25	3.76	1.36	0.04				
13.50	3.84	1.41	0.04				
13.75	3.91	1.46	0.04				
14.00	3.97	1.51	0.03				
14.25	4.03	1.55	0.03				
14.50	4.09	1.59	0.03				
14.75	4.14	1.63	0.03				
15.00	4.19	1.66	0.03				
15.25	4.23	1.69	0.02				
15.50	4.27	1.72	0.02				
15.75	4.31	1.75	0.02				
16.00	4.34	1.78	0.02				
16.25	4.37	1.80	0.02				
16.50	4.40	1.82	0.02				
16.75	4.43	1.84	0.02				
17.00	4.46	1.86	0.01				
17.25	4.48	1.88	0.01				
17.50	4.50	1.90	0.01				
17.75	4.53	1.92	0.01				

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 12.50 hrs, Volume= 0.000 af, Depth> 0.14"

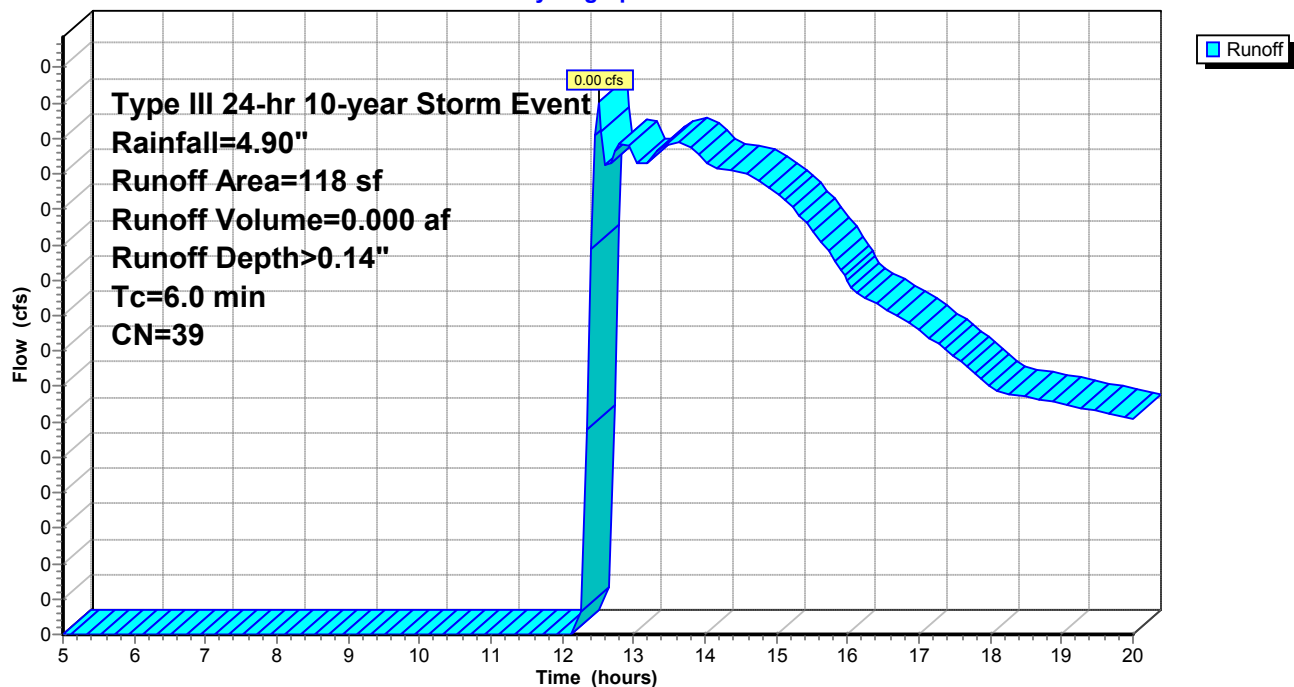
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
118	39	>75% Grass cover, Good, HSG A
118		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions2*Type III 24-hr 10-year Storm Event Rainfall=4.90"*

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	0.12	0.00
5.25	0.30	0.00	0.00	18.25	4.57	0.12	0.00
5.50	0.31	0.00	0.00	18.50	4.59	0.12	0.00
5.75	0.33	0.00	0.00	18.75	4.60	0.13	0.00
6.00	0.35	0.00	0.00	19.00	4.62	0.13	0.00
6.25	0.37	0.00	0.00	19.25	4.64	0.13	0.00
6.50	0.40	0.00	0.00	19.50	4.66	0.14	0.00
6.75	0.42	0.00	0.00	19.75	4.67	0.14	0.00
7.00	0.44	0.00	0.00	20.00	4.69	0.14	0.00
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.00	0.00				
10.25	0.99	0.00	0.00				
10.50	1.06	0.00	0.00				
10.75	1.14	0.00	0.00				
11.00	1.22	0.00	0.00				
11.25	1.33	0.00	0.00				
11.50	1.46	0.00	0.00				
11.75	1.74	0.00	0.00				
12.00	2.45	0.00	0.00				
12.25	3.16	0.00	0.00				
12.50	3.44	0.01	0.00				
12.75	3.57	0.01	0.00				
13.00	3.67	0.02	0.00				
13.25	3.76	0.02	0.00				
13.50	3.84	0.03	0.00				
13.75	3.91	0.04	0.00				
14.00	3.97	0.04	0.00				
14.25	4.03	0.05	0.00				
14.50	4.09	0.06	0.00				
14.75	4.14	0.06	0.00				
15.00	4.19	0.07	0.00				
15.25	4.23	0.07	0.00				
15.50	4.27	0.08	0.00				
15.75	4.31	0.08	0.00				
16.00	4.34	0.09	0.00				
16.25	4.37	0.09	0.00				
16.50	4.40	0.10	0.00				
16.75	4.43	0.10	0.00				
17.00	4.46	0.10	0.00				
17.25	4.48	0.11	0.00				
17.50	4.50	0.11	0.00				
17.75	4.53	0.11	0.00				

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 6S: Driveway

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

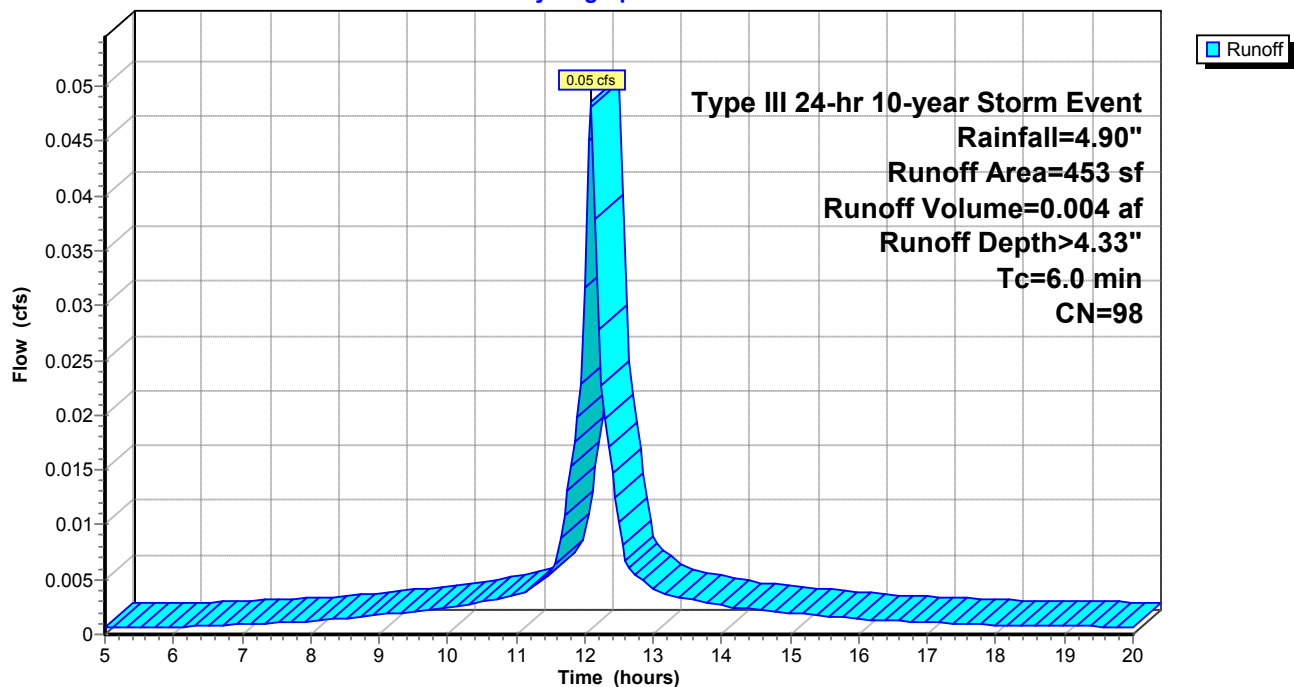
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
453	98	Paved parking & roofs
453		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Driveway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 6S: Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.13	0.00	18.00	4.55	4.31	0.00
5.25	0.30	0.14	0.00	18.25	4.57	4.33	0.00
5.50	0.31	0.16	0.00	18.50	4.59	4.35	0.00
5.75	0.33	0.17	0.00	18.75	4.60	4.37	0.00
6.00	0.35	0.19	0.00	19.00	4.62	4.39	0.00
6.25	0.37	0.21	0.00	19.25	4.64	4.40	0.00
6.50	0.40	0.22	0.00	19.50	4.66	4.42	0.00
6.75	0.42	0.25	0.00	19.75	4.67	4.44	0.00
7.00	0.44	0.27	0.00	20.00	4.69	4.45	0.00
7.25	0.47	0.29	0.00				
7.50	0.50	0.32	0.00				
7.75	0.53	0.34	0.00				
8.00	0.56	0.37	0.00				
8.25	0.59	0.40	0.00				
8.50	0.63	0.44	0.00				
8.75	0.67	0.48	0.00				
9.00	0.71	0.52	0.00				
9.25	0.76	0.56	0.00				
9.50	0.81	0.61	0.00				
9.75	0.87	0.66	0.00				
10.00	0.93	0.72	0.00				
10.25	0.99	0.78	0.00				
10.50	1.06	0.85	0.00				
10.75	1.14	0.93	0.00				
11.00	1.22	1.01	0.00				
11.25	1.33	1.11	0.00				
11.50	1.46	1.24	0.01				
11.75	1.74	1.52	0.01				
12.00	2.45	2.22	0.03				
12.25	3.16	2.93	0.02				
12.50	3.44	3.21	0.01				
12.75	3.57	3.34	0.01				
13.00	3.67	3.44	0.00				
13.25	3.76	3.53	0.00				
13.50	3.84	3.60	0.00				
13.75	3.91	3.68	0.00				
14.00	3.97	3.74	0.00				
14.25	4.03	3.80	0.00				
14.50	4.09	3.85	0.00				
14.75	4.14	3.90	0.00				
15.00	4.19	3.95	0.00				
15.25	4.23	3.99	0.00				
15.50	4.27	4.04	0.00				
15.75	4.31	4.07	0.00				
16.00	4.34	4.11	0.00				
16.25	4.37	4.14	0.00				
16.50	4.40	4.17	0.00				
16.75	4.43	4.19	0.00				
17.00	4.46	4.22	0.00				
17.25	4.48	4.25	0.00				
17.50	4.50	4.27	0.00				
17.75	4.53	4.29	0.00				

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 7S: Walkway

Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

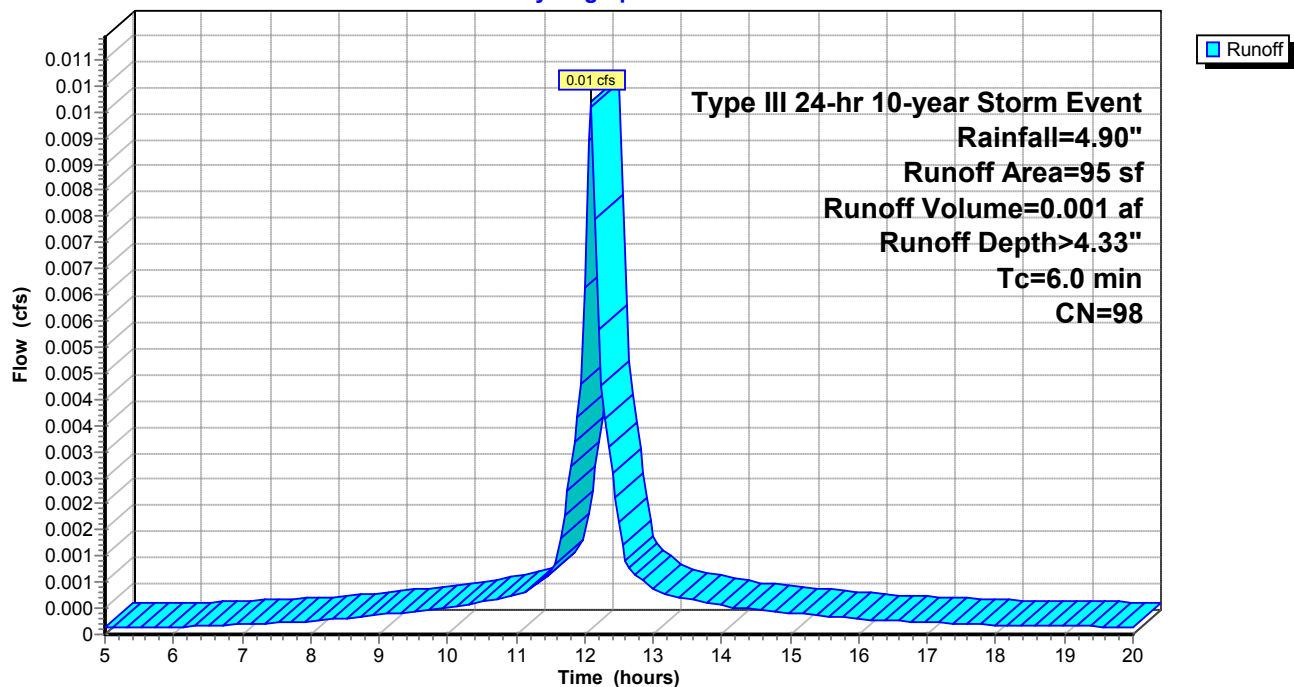
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
95	98	Paved parking & roofs
95		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.13	0.00	18.00	4.55	4.31	0.00
5.25	0.30	0.14	0.00	18.25	4.57	4.33	0.00
5.50	0.31	0.16	0.00	18.50	4.59	4.35	0.00
5.75	0.33	0.17	0.00	18.75	4.60	4.37	0.00
6.00	0.35	0.19	0.00	19.00	4.62	4.39	0.00
6.25	0.37	0.21	0.00	19.25	4.64	4.40	0.00
6.50	0.40	0.22	0.00	19.50	4.66	4.42	0.00
6.75	0.42	0.25	0.00	19.75	4.67	4.44	0.00
7.00	0.44	0.27	0.00	20.00	4.69	4.45	0.00
7.25	0.47	0.29	0.00				
7.50	0.50	0.32	0.00				
7.75	0.53	0.34	0.00				
8.00	0.56	0.37	0.00				
8.25	0.59	0.40	0.00				
8.50	0.63	0.44	0.00				
8.75	0.67	0.48	0.00				
9.00	0.71	0.52	0.00				
9.25	0.76	0.56	0.00				
9.50	0.81	0.61	0.00				
9.75	0.87	0.66	0.00				
10.00	0.93	0.72	0.00				
10.25	0.99	0.78	0.00				
10.50	1.06	0.85	0.00				
10.75	1.14	0.93	0.00				
11.00	1.22	1.01	0.00				
11.25	1.33	1.11	0.00				
11.50	1.46	1.24	0.00				
11.75	1.74	1.52	0.00				
12.00	2.45	2.22	0.01				
12.25	3.16	2.93	0.00				
12.50	3.44	3.21	0.00				
12.75	3.57	3.34	0.00				
13.00	3.67	3.44	0.00				
13.25	3.76	3.53	0.00				
13.50	3.84	3.60	0.00				
13.75	3.91	3.68	0.00				
14.00	3.97	3.74	0.00				
14.25	4.03	3.80	0.00				
14.50	4.09	3.85	0.00				
14.75	4.14	3.90	0.00				
15.00	4.19	3.95	0.00				
15.25	4.23	3.99	0.00				
15.50	4.27	4.04	0.00				
15.75	4.31	4.07	0.00				
16.00	4.34	4.11	0.00				
16.25	4.37	4.14	0.00				
16.50	4.40	4.17	0.00				
16.75	4.43	4.19	0.00				
17.00	4.46	4.22	0.00				
17.25	4.48	4.25	0.00				
17.50	4.50	4.27	0.00				
17.75	4.53	4.29	0.00				

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 12.50 hrs, Volume= 0.000 af, Depth> 0.14"

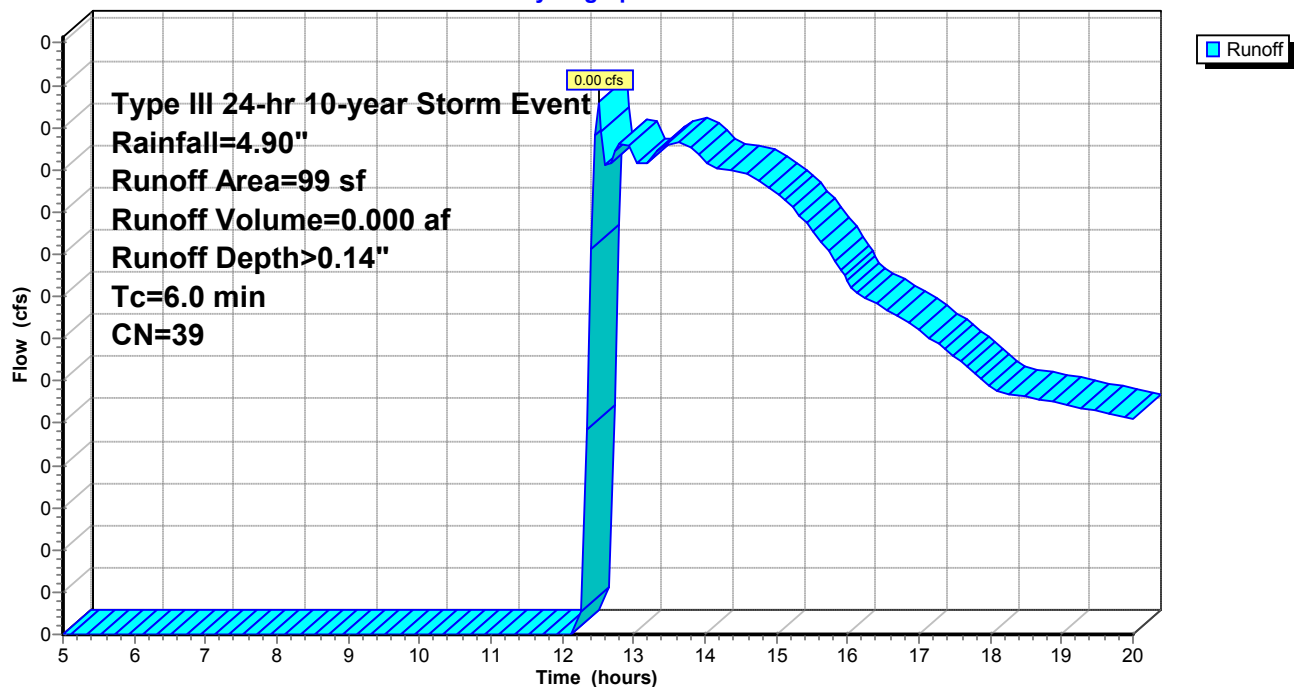
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

Prepared by Gala Simon Associates

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	0.12	0.00
5.25	0.30	0.00	0.00	18.25	4.57	0.12	0.00
5.50	0.31	0.00	0.00	18.50	4.59	0.12	0.00
5.75	0.33	0.00	0.00	18.75	4.60	0.13	0.00
6.00	0.35	0.00	0.00	19.00	4.62	0.13	0.00
6.25	0.37	0.00	0.00	19.25	4.64	0.13	0.00
6.50	0.40	0.00	0.00	19.50	4.66	0.14	0.00
6.75	0.42	0.00	0.00	19.75	4.67	0.14	0.00
7.00	0.44	0.00	0.00	20.00	4.69	0.14	0.00
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.00	0.00				
10.25	0.99	0.00	0.00				
10.50	1.06	0.00	0.00				
10.75	1.14	0.00	0.00				
11.00	1.22	0.00	0.00				
11.25	1.33	0.00	0.00				
11.50	1.46	0.00	0.00				
11.75	1.74	0.00	0.00				
12.00	2.45	0.00	0.00				
12.25	3.16	0.00	0.00				
12.50	3.44	0.01	0.00				
12.75	3.57	0.01	0.00				
13.00	3.67	0.02	0.00				
13.25	3.76	0.02	0.00				
13.50	3.84	0.03	0.00				
13.75	3.91	0.04	0.00				
14.00	3.97	0.04	0.00				
14.25	4.03	0.05	0.00				
14.50	4.09	0.06	0.00				
14.75	4.14	0.06	0.00				
15.00	4.19	0.07	0.00				
15.25	4.23	0.07	0.00				
15.50	4.27	0.08	0.00				
15.75	4.31	0.08	0.00				
16.00	4.34	0.09	0.00				
16.25	4.37	0.09	0.00				
16.50	4.40	0.10	0.00				
16.75	4.43	0.10	0.00				
17.00	4.46	0.10	0.00				
17.25	4.48	0.11	0.00				
17.50	4.50	0.11	0.00				
17.75	4.53	0.11	0.00				

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 2.19" for 10-year Storm Event event
 Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 12.00 hrs, Volume= 0.001 af, Atten= 51%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 12.00 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.34' @ 12.24 hrs Surf.Area= 0 sf Storage= 3 cf

Plug-Flow detention time= 2.9 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 2.7 min (744.4 - 741.8)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	16 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	16

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 12.00 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions2

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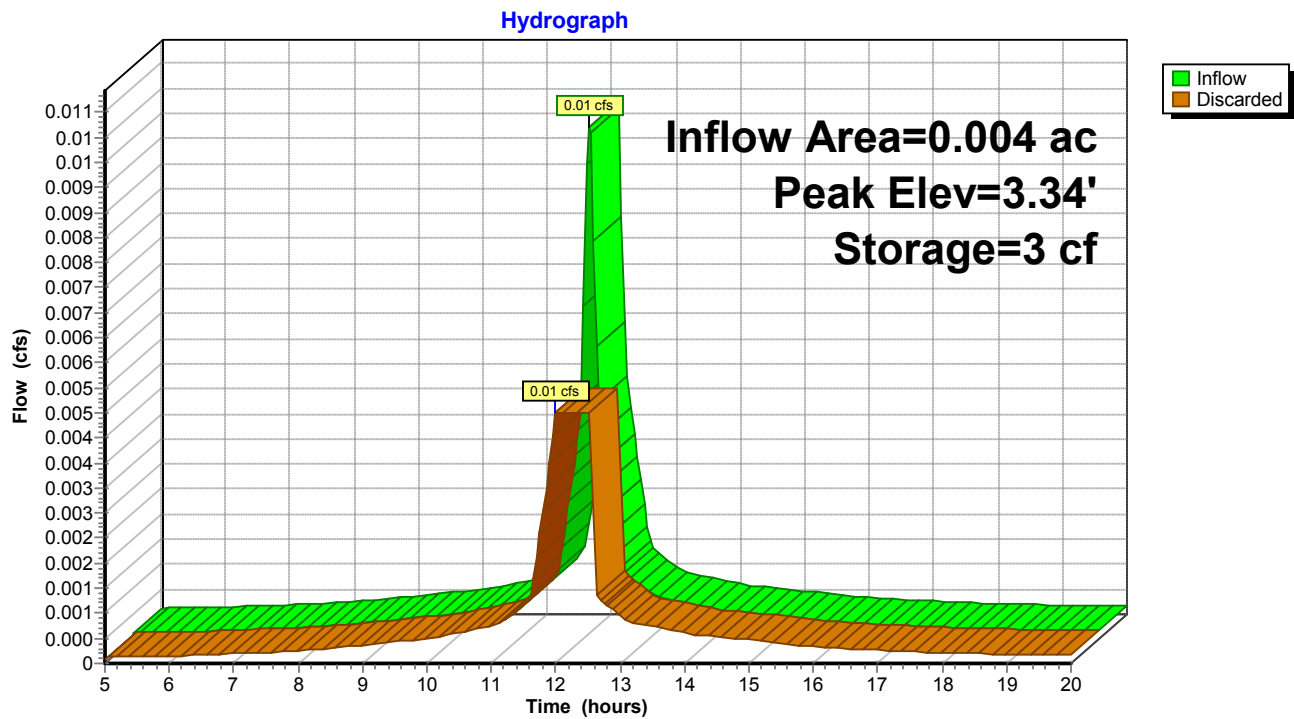
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Type III 24-hr 10-year Storm Event Rainfall=4.90"

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3/26/2020

Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions2*Type III 24-hr 10-year Storm Event Rainfall=4.90"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.00	0	3.25	0.00
12.00	0.01	0	3.26	0.01
12.50	0.00	2	3.30	0.01
13.00	0.00	0	3.25	0.00
13.50	0.00	0	3.25	0.00
14.00	0.00	0	3.25	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.013 ac, Inflow Depth > 3.46" for 10-year Storm Event event
 Inflow = 0.05 cfs @ 12.09 hrs, Volume= 0.004 af
 Outflow = 0.03 cfs @ 12.00 hrs, Volume= 0.004 af, Atten= 49%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 12.00 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.34' @ 12.23 hrs Surf.Area= 0 sf Storage= 13 cf

Plug-Flow detention time= 2.6 min calculated for 0.004 af (100% of inflow)
 Center-of-Mass det. time= 2.4 min (739.3 - 736.9)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	75 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	75

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 12.00 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions2

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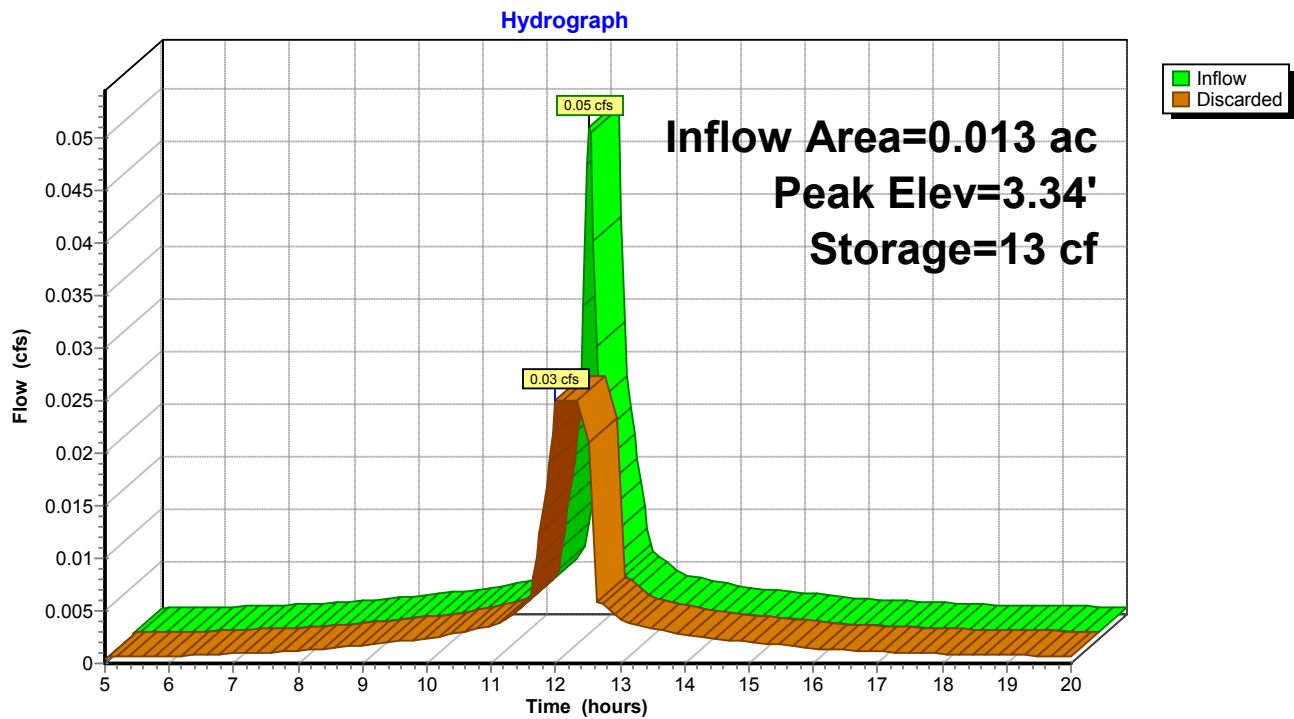
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Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions2

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.01	0	3.25	0.01
12.00	0.03	2	3.26	0.03
12.50	0.01	5	3.28	0.03
13.00	0.00	0	3.25	0.00
13.50	0.00	0	3.25	0.00
14.00	0.00	0	3.25	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 1S: Remainder of Land

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

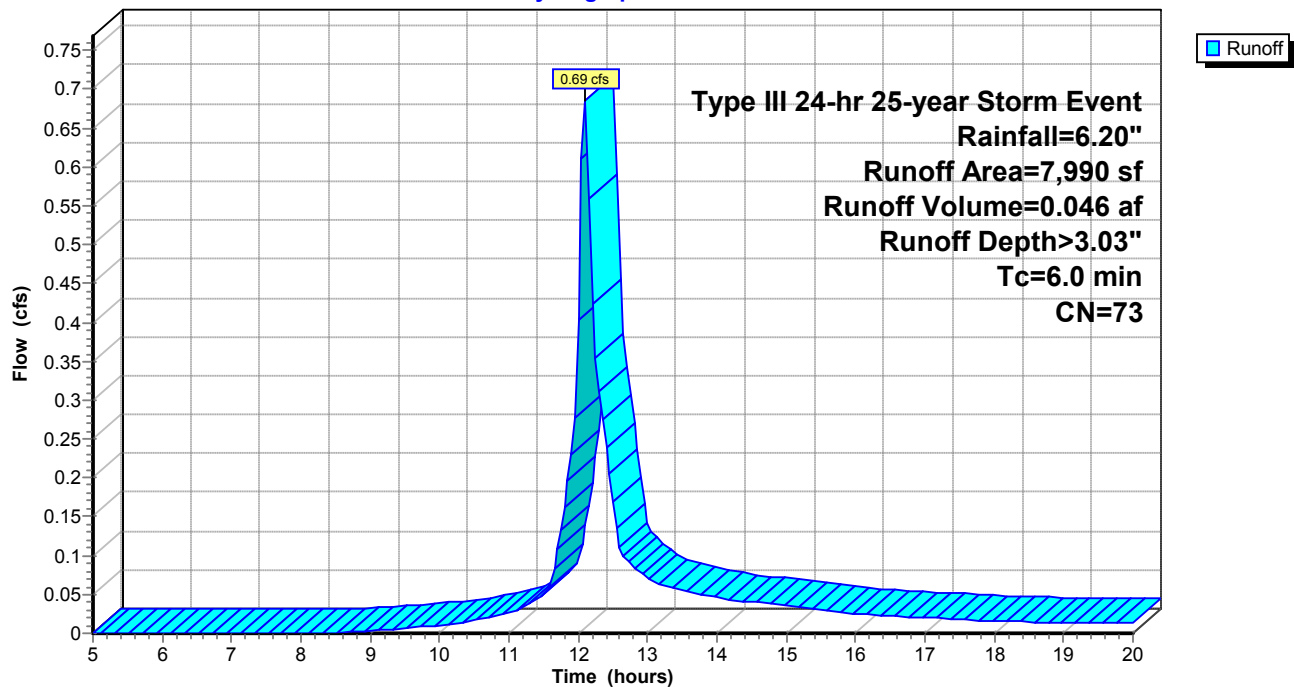
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
1,441	98	Paved parking & roofs
4,706	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
7,990	73	Weighted Average
6,549		Pervious Area
1,441		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	2.89	0.02
5.25	0.37	0.00	0.00	18.25	5.78	2.91	0.01
5.50	0.40	0.00	0.00	18.50	5.80	2.93	0.01
5.75	0.42	0.00	0.00	18.75	5.83	2.94	0.01
6.00	0.45	0.00	0.00	19.00	5.85	2.96	0.01
6.25	0.47	0.00	0.00	19.25	5.87	2.98	0.01
6.50	0.50	0.00	0.00	19.50	5.89	3.00	0.01
6.75	0.53	0.00	0.00	19.75	5.91	3.02	0.01
7.00	0.56	0.00	0.00	20.00	5.93	3.03	0.01
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.01	0.00				
9.25	0.96	0.01	0.00				
9.50	1.03	0.02	0.01				
9.75	1.10	0.03	0.01				
10.00	1.17	0.05	0.01				
10.25	1.25	0.06	0.01				
10.50	1.34	0.08	0.02				
10.75	1.44	0.11	0.02				
11.00	1.55	0.15	0.03				
11.25	1.68	0.19	0.04				
11.50	1.85	0.26	0.05				
11.75	2.20	0.41	0.13				
12.00	3.10	0.92	0.40				
12.25	4.00	1.53	0.35				
12.50	4.35	1.79	0.17				
12.75	4.52	1.91	0.09				
13.00	4.65	2.01	0.07				
13.25	4.76	2.09	0.06				
13.50	4.86	2.17	0.06				
13.75	4.95	2.24	0.05				
14.00	5.03	2.30	0.05				
14.25	5.10	2.36	0.04				
14.50	5.17	2.42	0.04				
14.75	5.24	2.47	0.04				
15.00	5.30	2.52	0.04				
15.25	5.35	2.56	0.03				
15.50	5.40	2.60	0.03				
15.75	5.45	2.64	0.03				
16.00	5.49	2.67	0.03				
16.25	5.53	2.71	0.02				
16.50	5.57	2.74	0.02				
16.75	5.61	2.76	0.02				
17.00	5.64	2.79	0.02				
17.25	5.67	2.82	0.02				
17.50	5.70	2.84	0.02				
17.75	5.73	2.86	0.02				

[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

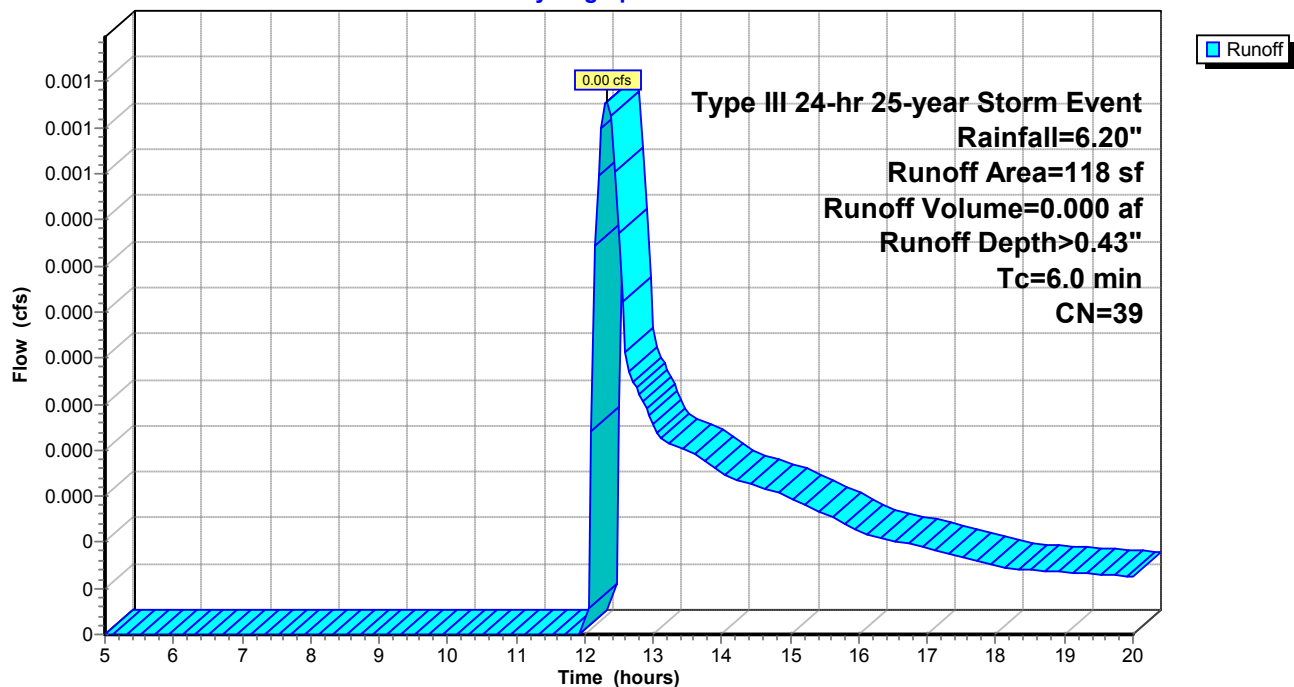
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
118	39	>75% Grass cover, Good, HSG A
118		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	0.38	0.00
5.25	0.37	0.00	0.00	18.25	5.78	0.38	0.00
5.50	0.40	0.00	0.00	18.50	5.80	0.39	0.00
5.75	0.42	0.00	0.00	18.75	5.83	0.40	0.00
6.00	0.45	0.00	0.00	19.00	5.85	0.40	0.00
6.25	0.47	0.00	0.00	19.25	5.87	0.41	0.00
6.50	0.50	0.00	0.00	19.50	5.89	0.42	0.00
6.75	0.53	0.00	0.00	19.75	5.91	0.42	0.00
7.00	0.56	0.00	0.00	20.00	5.93	0.43	0.00
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.00	0.00				
9.50	1.03	0.00	0.00				
9.75	1.10	0.00	0.00				
10.00	1.17	0.00	0.00				
10.25	1.25	0.00	0.00				
10.50	1.34	0.00	0.00				
10.75	1.44	0.00	0.00				
11.00	1.55	0.00	0.00				
11.25	1.68	0.00	0.00				
11.50	1.85	0.00	0.00				
11.75	2.20	0.00	0.00				
12.00	3.10	0.00	0.00				
12.25	4.00	0.05	0.00				
12.50	4.35	0.09	0.00				
12.75	4.52	0.11	0.00				
13.00	4.65	0.13	0.00				
13.25	4.76	0.15	0.00				
13.50	4.86	0.17	0.00				
13.75	4.95	0.19	0.00				
14.00	5.03	0.21	0.00				
14.25	5.10	0.22	0.00				
14.50	5.17	0.24	0.00				
14.75	5.24	0.25	0.00				
15.00	5.30	0.26	0.00				
15.25	5.35	0.28	0.00				
15.50	5.40	0.29	0.00				
15.75	5.45	0.30	0.00				
16.00	5.49	0.31	0.00				
16.25	5.53	0.32	0.00				
16.50	5.57	0.33	0.00				
16.75	5.61	0.34	0.00				
17.00	5.64	0.35	0.00				
17.25	5.67	0.36	0.00				
17.50	5.70	0.36	0.00				
17.75	5.73	0.37	0.00				

[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 6S: Driveway

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

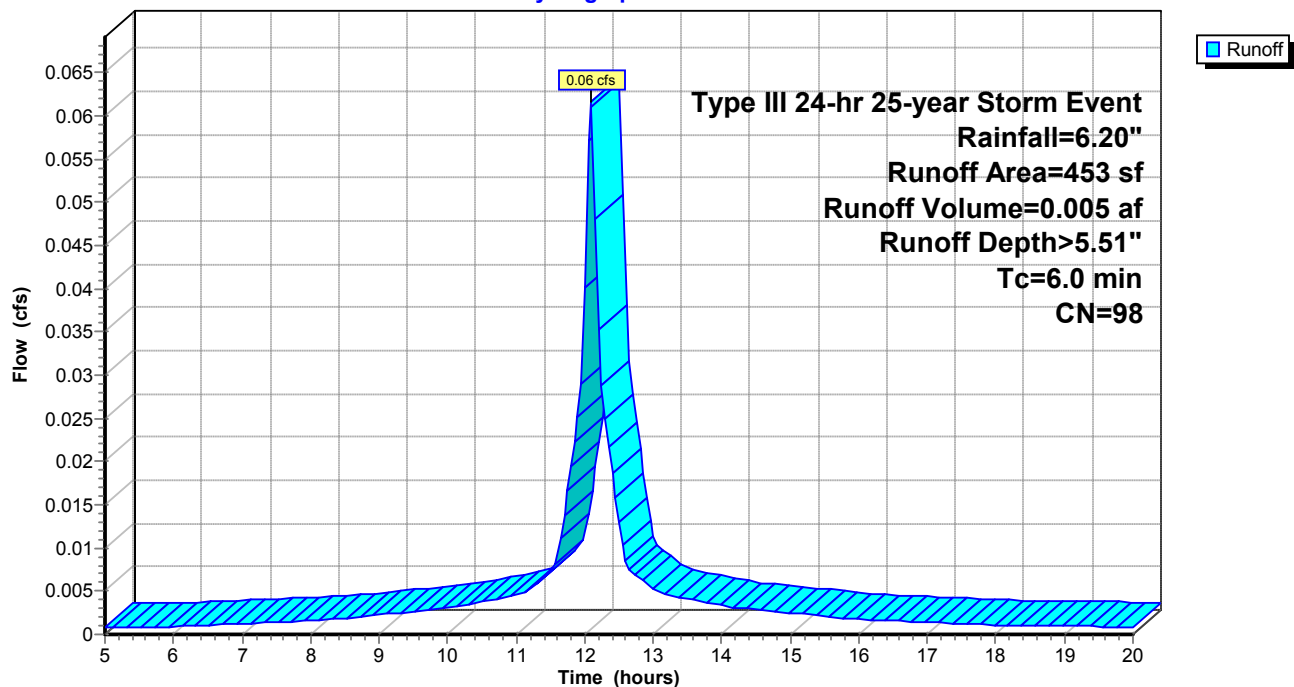
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
453	98	Paved parking & roofs
453		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Driveway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 6S: Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.19	0.00	18.00	5.75	5.52	0.00
5.25	0.37	0.21	0.00	18.25	5.78	5.54	0.00
5.50	0.40	0.23	0.00	18.50	5.80	5.56	0.00
5.75	0.42	0.25	0.00	18.75	5.83	5.59	0.00
6.00	0.45	0.27	0.00	19.00	5.85	5.61	0.00
6.25	0.47	0.29	0.00	19.25	5.87	5.63	0.00
6.50	0.50	0.32	0.00	19.50	5.89	5.65	0.00
6.75	0.53	0.34	0.00	19.75	5.91	5.67	0.00
7.00	0.56	0.37	0.00	20.00	5.93	5.70	0.00
7.25	0.59	0.40	0.00				
7.50	0.63	0.44	0.00				
7.75	0.67	0.47	0.00				
8.00	0.71	0.51	0.00				
8.25	0.75	0.55	0.00				
8.50	0.80	0.59	0.00				
8.75	0.85	0.64	0.00				
9.00	0.90	0.70	0.00				
9.25	0.96	0.76	0.00				
9.50	1.03	0.82	0.00				
9.75	1.10	0.89	0.00				
10.00	1.17	0.96	0.00				
10.25	1.25	1.04	0.00				
10.50	1.34	1.13	0.00				
10.75	1.44	1.22	0.00				
11.00	1.55	1.33	0.00				
11.25	1.68	1.46	0.01				
11.50	1.85	1.62	0.01				
11.75	2.20	1.98	0.02				
12.00	3.10	2.87	0.04				
12.25	4.00	3.76	0.03				
12.50	4.35	4.12	0.01				
12.75	4.52	4.28	0.01				
13.00	4.65	4.41	0.01				
13.25	4.76	4.52	0.00				
13.50	4.86	4.62	0.00				
13.75	4.95	4.71	0.00				
14.00	5.03	4.79	0.00				
14.25	5.10	4.86	0.00				
14.50	5.17	4.93	0.00				
14.75	5.24	5.00	0.00				
15.00	5.30	5.06	0.00				
15.25	5.35	5.11	0.00				
15.50	5.40	5.17	0.00				
15.75	5.45	5.21	0.00				
16.00	5.49	5.26	0.00				
16.25	5.53	5.29	0.00				
16.50	5.57	5.33	0.00				
16.75	5.61	5.37	0.00				
17.00	5.64	5.40	0.00				
17.25	5.67	5.43	0.00				
17.50	5.70	5.46	0.00				
17.75	5.73	5.49	0.00				

[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 7S: Walkway

Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

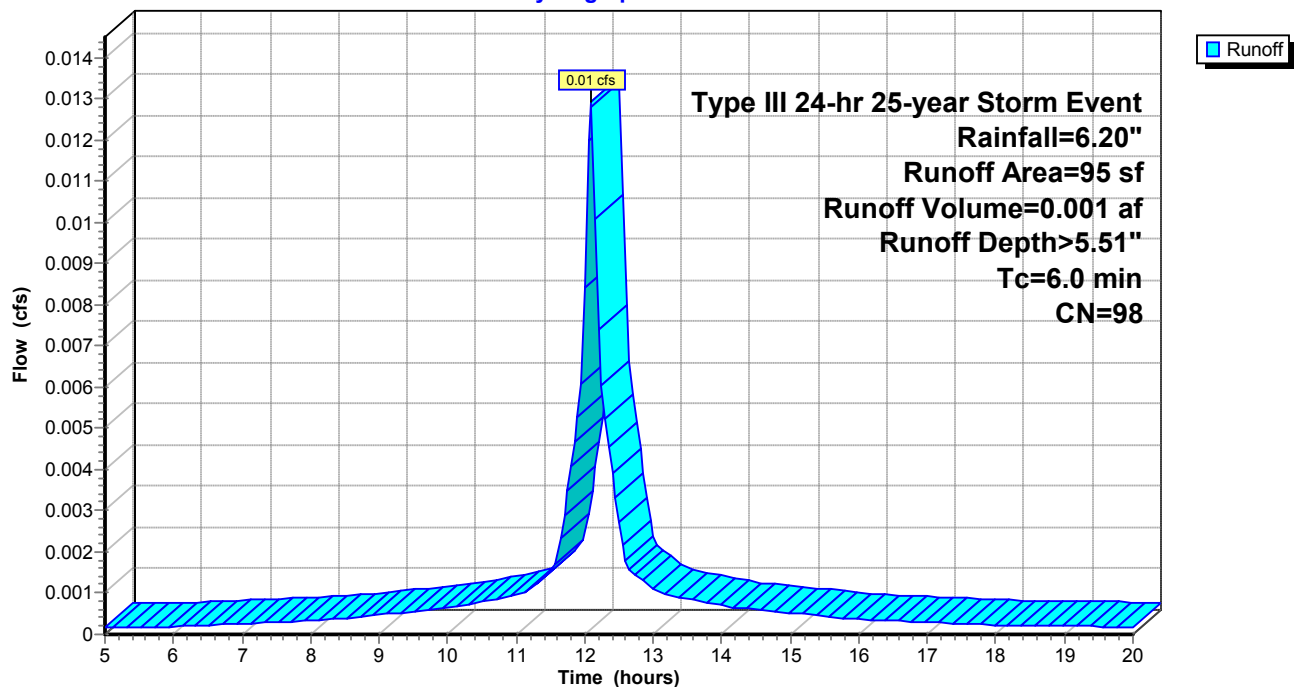
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
95	98	Paved parking & roofs
95		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.19	0.00	18.00	5.75	5.52	0.00
5.25	0.37	0.21	0.00	18.25	5.78	5.54	0.00
5.50	0.40	0.23	0.00	18.50	5.80	5.56	0.00
5.75	0.42	0.25	0.00	18.75	5.83	5.59	0.00
6.00	0.45	0.27	0.00	19.00	5.85	5.61	0.00
6.25	0.47	0.29	0.00	19.25	5.87	5.63	0.00
6.50	0.50	0.32	0.00	19.50	5.89	5.65	0.00
6.75	0.53	0.34	0.00	19.75	5.91	5.67	0.00
7.00	0.56	0.37	0.00	20.00	5.93	5.70	0.00
7.25	0.59	0.40	0.00				
7.50	0.63	0.44	0.00				
7.75	0.67	0.47	0.00				
8.00	0.71	0.51	0.00				
8.25	0.75	0.55	0.00				
8.50	0.80	0.59	0.00				
8.75	0.85	0.64	0.00				
9.00	0.90	0.70	0.00				
9.25	0.96	0.76	0.00				
9.50	1.03	0.82	0.00				
9.75	1.10	0.89	0.00				
10.00	1.17	0.96	0.00				
10.25	1.25	1.04	0.00				
10.50	1.34	1.13	0.00				
10.75	1.44	1.22	0.00				
11.00	1.55	1.33	0.00				
11.25	1.68	1.46	0.00				
11.50	1.85	1.62	0.00				
11.75	2.20	1.98	0.00				
12.00	3.10	2.87	0.01				
12.25	4.00	3.76	0.01				
12.50	4.35	4.12	0.00				
12.75	4.52	4.28	0.00				
13.00	4.65	4.41	0.00				
13.25	4.76	4.52	0.00				
13.50	4.86	4.62	0.00				
13.75	4.95	4.71	0.00				
14.00	5.03	4.79	0.00				
14.25	5.10	4.86	0.00				
14.50	5.17	4.93	0.00				
14.75	5.24	5.00	0.00				
15.00	5.30	5.06	0.00				
15.25	5.35	5.11	0.00				
15.50	5.40	5.17	0.00				
15.75	5.45	5.21	0.00				
16.00	5.49	5.26	0.00				
16.25	5.53	5.29	0.00				
16.50	5.57	5.33	0.00				
16.75	5.61	5.37	0.00				
17.00	5.64	5.40	0.00				
17.25	5.67	5.43	0.00				
17.50	5.70	5.46	0.00				
17.75	5.73	5.49	0.00				

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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

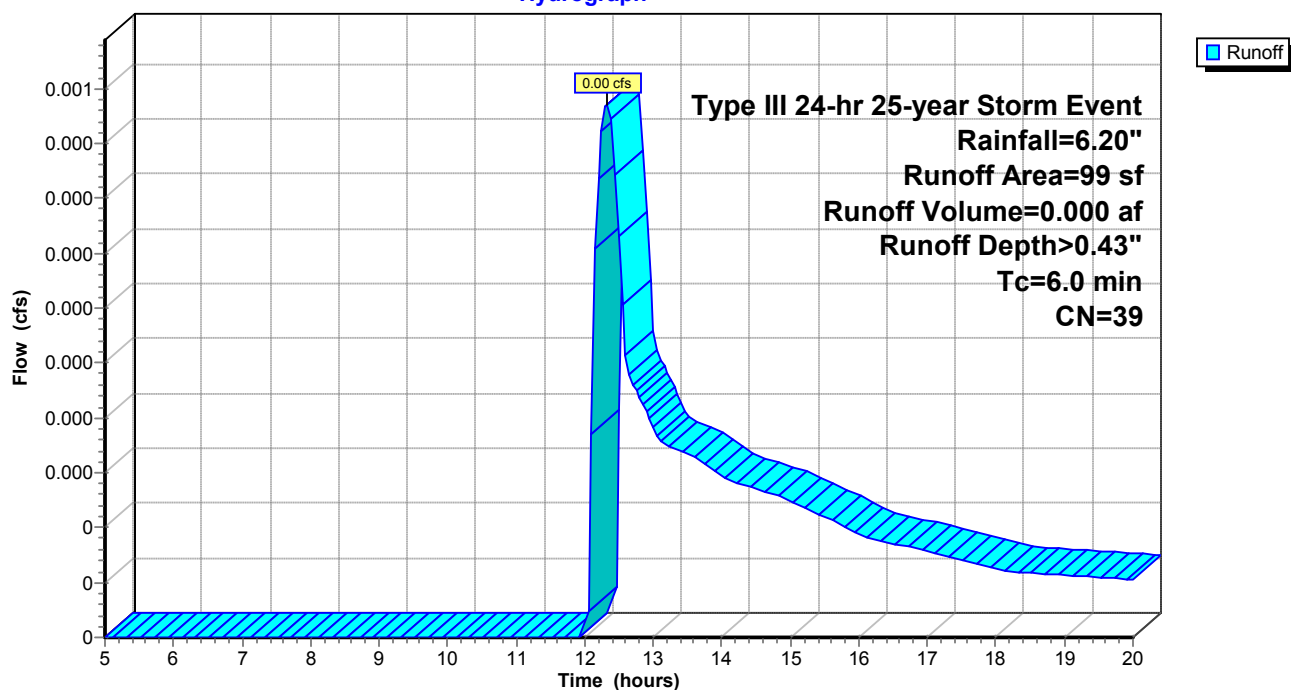
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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3/26/2020

Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	0.38	0.00
5.25	0.37	0.00	0.00	18.25	5.78	0.38	0.00
5.50	0.40	0.00	0.00	18.50	5.80	0.39	0.00
5.75	0.42	0.00	0.00	18.75	5.83	0.40	0.00
6.00	0.45	0.00	0.00	19.00	5.85	0.40	0.00
6.25	0.47	0.00	0.00	19.25	5.87	0.41	0.00
6.50	0.50	0.00	0.00	19.50	5.89	0.42	0.00
6.75	0.53	0.00	0.00	19.75	5.91	0.42	0.00
7.00	0.56	0.00	0.00	20.00	5.93	0.43	0.00
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.00	0.00				
9.50	1.03	0.00	0.00				
9.75	1.10	0.00	0.00				
10.00	1.17	0.00	0.00				
10.25	1.25	0.00	0.00				
10.50	1.34	0.00	0.00				
10.75	1.44	0.00	0.00				
11.00	1.55	0.00	0.00				
11.25	1.68	0.00	0.00				
11.50	1.85	0.00	0.00				
11.75	2.20	0.00	0.00				
12.00	3.10	0.00	0.00				
12.25	4.00	0.05	0.00				
12.50	4.35	0.09	0.00				
12.75	4.52	0.11	0.00				
13.00	4.65	0.13	0.00				
13.25	4.76	0.15	0.00				
13.50	4.86	0.17	0.00				
13.75	4.95	0.19	0.00				
14.00	5.03	0.21	0.00				
14.25	5.10	0.22	0.00				
14.50	5.17	0.24	0.00				
14.75	5.24	0.25	0.00				
15.00	5.30	0.26	0.00				
15.25	5.35	0.28	0.00				
15.50	5.40	0.29	0.00				
15.75	5.45	0.30	0.00				
16.00	5.49	0.31	0.00				
16.25	5.53	0.32	0.00				
16.50	5.57	0.33	0.00				
16.75	5.61	0.34	0.00				
17.00	5.64	0.35	0.00				
17.25	5.67	0.36	0.00				
17.50	5.70	0.36	0.00				
17.75	5.73	0.37	0.00				

[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 2.92" for 25-year Storm Event event
 Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 11.90 hrs, Volume= 0.001 af, Atten= 62%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.90 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.43' @ 12.35 hrs Surf.Area= 0 sf Storage= 6 cf

Plug-Flow detention time= 5.4 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 5.1 min (750.3 - 745.2)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	16 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	16

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 11.90 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions2

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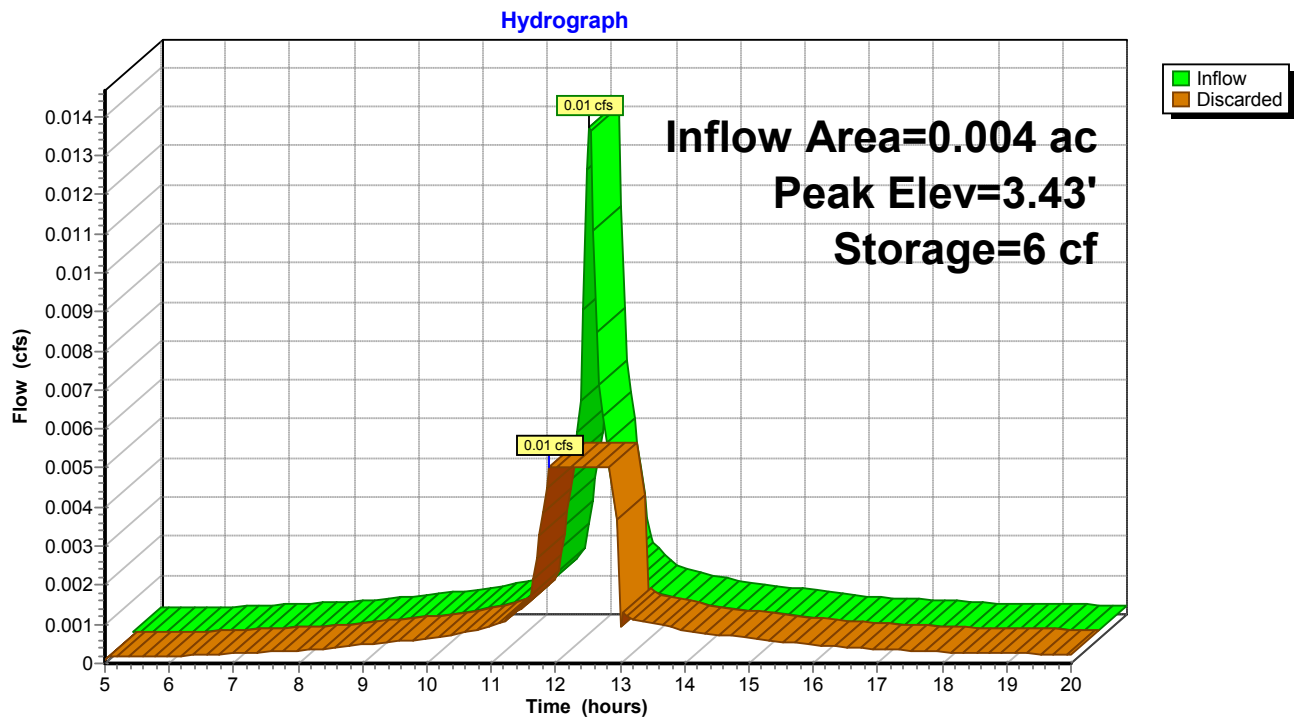
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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions2*Type III 24-hr 25-year Storm Event Rainfall=6.20"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.00	0	3.25	0.00
12.00	0.01	1	3.28	0.01
12.50	0.00	5	3.41	0.01
13.00	0.00	0	3.25	0.00
13.50	0.00	0	3.25	0.00
14.00	0.00	0	3.25	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.013 ac, Inflow Depth > 4.46" for 25-year Storm Event event
 Inflow = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af
 Outflow = 0.03 cfs @ 11.95 hrs, Volume= 0.005 af, Atten= 60%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.95 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.41' @ 12.31 hrs Surf.Area= 0 sf Storage= 24 cf

Plug-Flow detention time= 4.6 min calculated for 0.005 af (100% of inflow)
 Center-of-Mass det. time= 4.3 min (741.3 - 737.0)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	75 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	75

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 11.95 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions2

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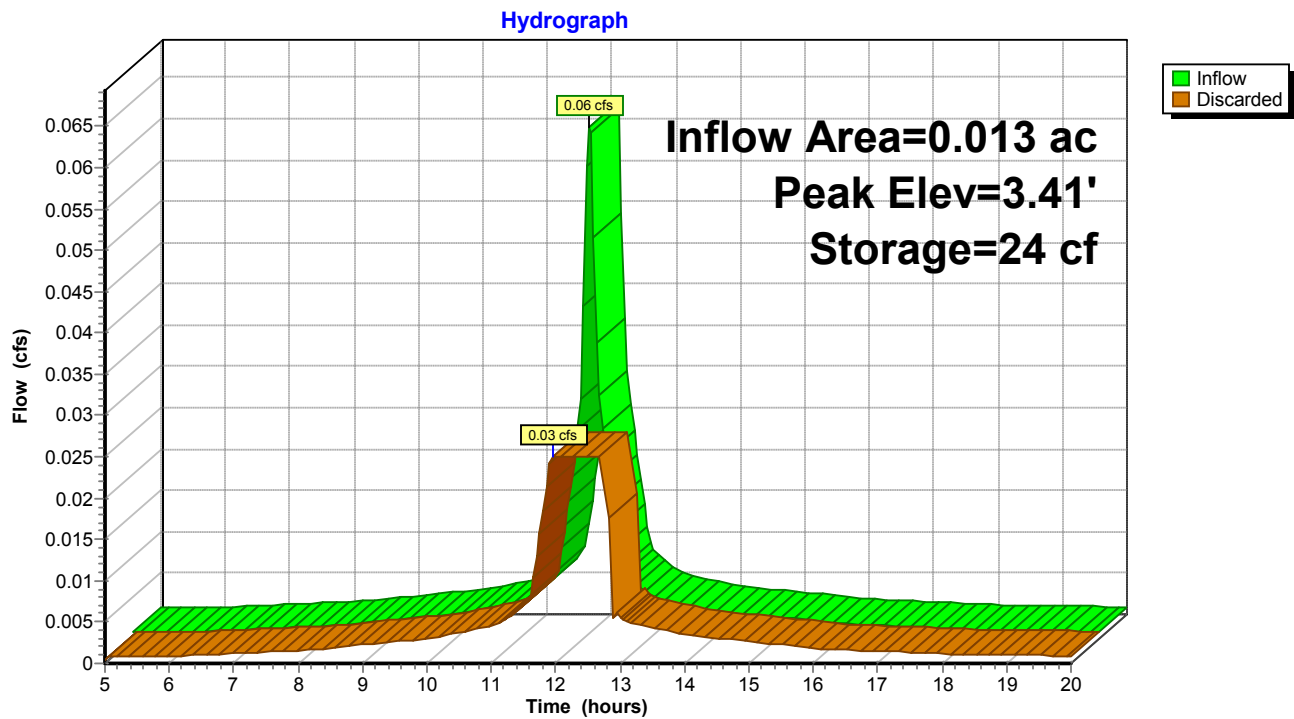
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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions2

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.01	0	3.25	0.01
12.00	0.04	4	3.27	0.03
12.50	0.01	20	3.39	0.03
13.00	0.01	0	3.25	0.01
13.50	0.00	0	3.25	0.00
14.00	0.00	0	3.25	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 1S: Remainder of Land

Runoff = 1.18 cfs @ 12.09 hrs, Volume= 0.080 af, Depth> 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

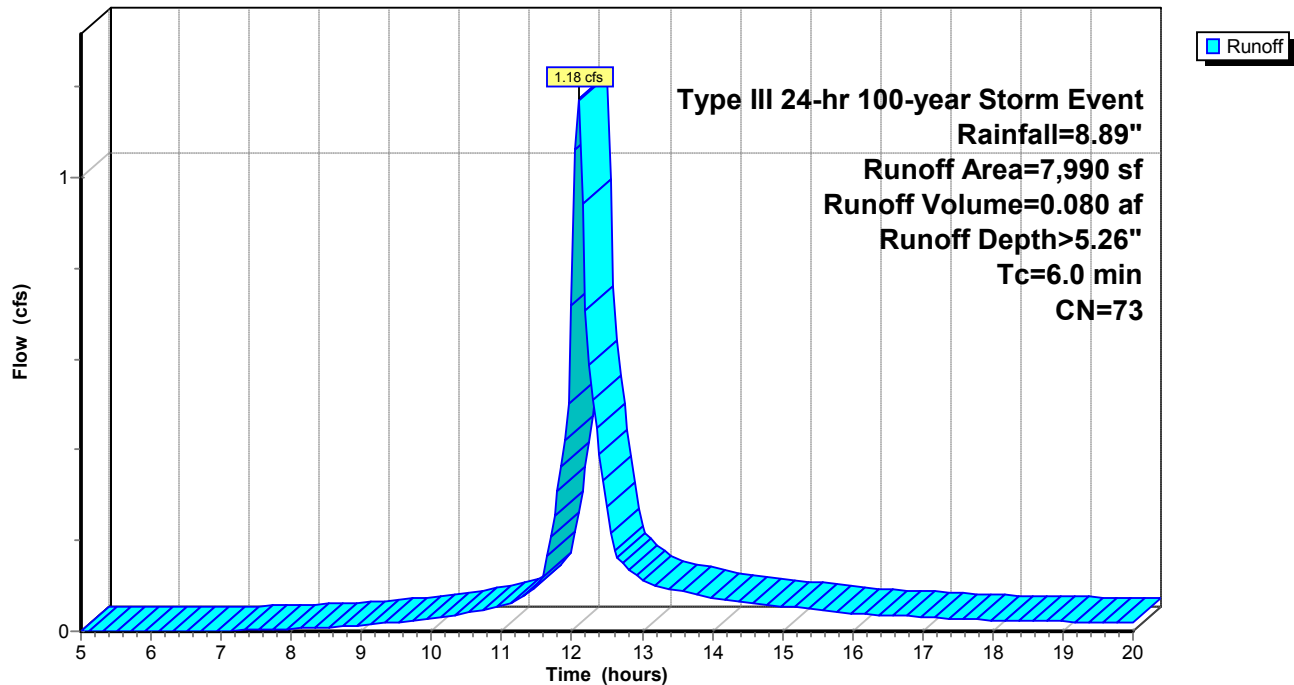
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
1,441	98	Paved parking & roofs
4,706	61	>75% Grass cover, Good, HSG B
1,843	82	Dirt roads, HSG B
7,990	73	Weighted Average
6,549		Pervious Area
1,441		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	5.03	0.02
5.25	0.54	0.00	0.00	18.25	8.29	5.06	0.02
5.50	0.57	0.00	0.00	18.50	8.32	5.09	0.02
5.75	0.60	0.00	0.00	18.75	8.35	5.12	0.02
6.00	0.64	0.00	0.00	19.00	8.39	5.15	0.02
6.25	0.68	0.00	0.00	19.25	8.42	5.18	0.02
6.50	0.72	0.00	0.00	19.50	8.45	5.21	0.02
6.75	0.76	0.00	0.00	19.75	8.48	5.24	0.02
7.00	0.80	0.00	0.00	20.00	8.51	5.26	0.02
7.25	0.85	0.00	0.00				
7.50	0.90	0.01	0.00				
7.75	0.96	0.01	0.00				
8.00	1.01	0.02	0.01				
8.25	1.07	0.03	0.01				
8.50	1.14	0.04	0.01				
8.75	1.22	0.05	0.01				
9.00	1.30	0.07	0.01				
9.25	1.38	0.10	0.02				
9.50	1.48	0.12	0.02				
9.75	1.57	0.15	0.02				
10.00	1.68	0.19	0.03				
10.25	1.80	0.23	0.03				
10.50	1.92	0.29	0.04				
10.75	2.07	0.35	0.05				
11.00	2.22	0.42	0.06				
11.25	2.41	0.52	0.07				
11.50	2.65	0.65	0.10				
11.75	3.16	0.96	0.26				
12.00	4.44	1.85	0.72				
12.25	5.73	2.87	0.59				
12.50	6.24	3.29	0.27				
12.75	6.48	3.49	0.15				
13.00	6.67	3.65	0.11				
13.25	6.82	3.78	0.10				
13.50	6.97	3.91	0.09				
13.75	7.09	4.02	0.08				
14.00	7.21	4.12	0.07				
14.25	7.32	4.21	0.07				
14.50	7.41	4.30	0.06				
14.75	7.51	4.38	0.06				
15.00	7.59	4.45	0.06				
15.25	7.67	4.52	0.05				
15.50	7.75	4.59	0.05				
15.75	7.82	4.65	0.04				
16.00	7.88	4.70	0.04				
16.25	7.93	4.75	0.04				
16.50	7.99	4.80	0.03				
16.75	8.04	4.84	0.03				
17.00	8.09	4.89	0.03				
17.25	8.13	4.93	0.03				
17.50	8.17	4.96	0.03				
17.75	8.21	5.00	0.03				

[1120] Proposed Conditions2

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 12.12 hrs, Volume= 0.000 af, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

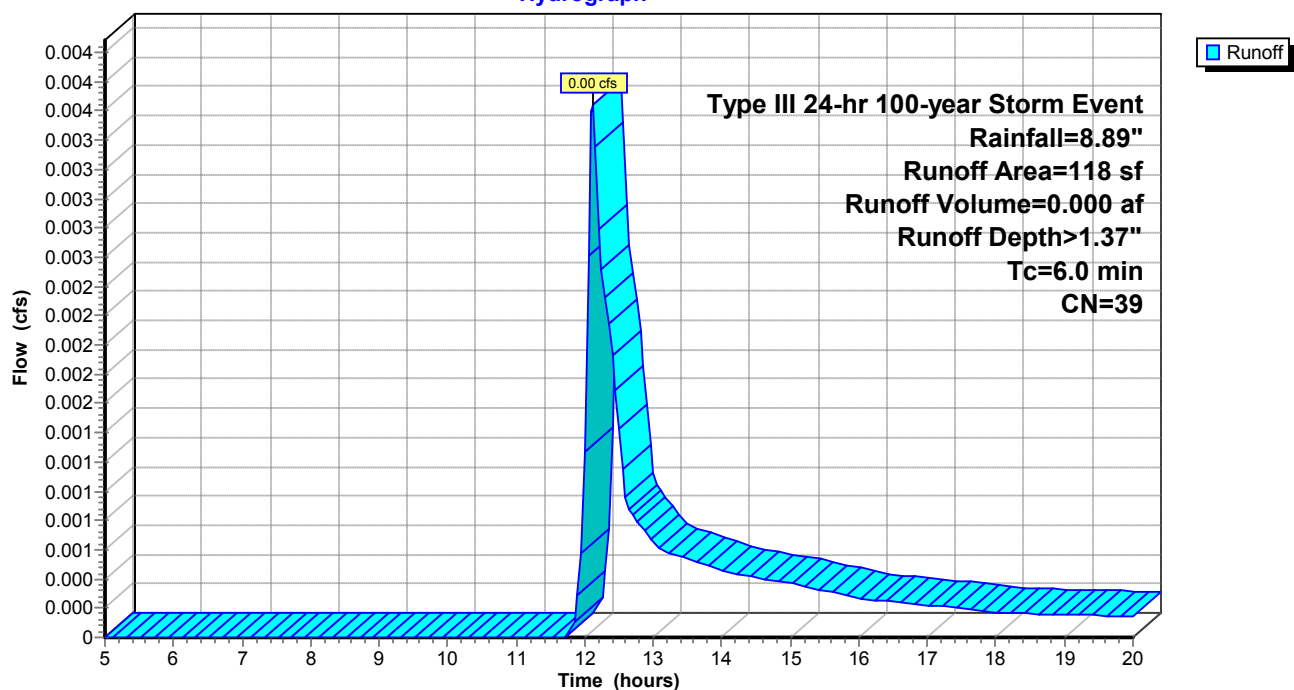
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
118	39	>75% Grass cover, Good, HSG A
118		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions2*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	1.26	0.00
5.25	0.54	0.00	0.00	18.25	8.29	1.28	0.00
5.50	0.57	0.00	0.00	18.50	8.32	1.29	0.00
5.75	0.60	0.00	0.00	18.75	8.35	1.31	0.00
6.00	0.64	0.00	0.00	19.00	8.39	1.32	0.00
6.25	0.68	0.00	0.00	19.25	8.42	1.34	0.00
6.50	0.72	0.00	0.00	19.50	8.45	1.35	0.00
6.75	0.76	0.00	0.00	19.75	8.48	1.36	0.00
7.00	0.80	0.00	0.00	20.00	8.51	1.38	0.00
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.00	0.00				
8.00	1.01	0.00	0.00				
8.25	1.07	0.00	0.00				
8.50	1.14	0.00	0.00				
8.75	1.22	0.00	0.00				
9.00	1.30	0.00	0.00				
9.25	1.38	0.00	0.00				
9.50	1.48	0.00	0.00				
9.75	1.57	0.00	0.00				
10.00	1.68	0.00	0.00				
10.25	1.80	0.00	0.00				
10.50	1.92	0.00	0.00				
10.75	2.07	0.00	0.00				
11.00	2.22	0.00	0.00				
11.25	2.41	0.00	0.00				
11.50	2.65	0.00	0.00				
11.75	3.16	0.00	0.00				
12.00	4.44	0.10	0.00				
12.25	5.73	0.37	0.00				
12.50	6.24	0.52	0.00				
12.75	6.48	0.59	0.00				
13.00	6.67	0.65	0.00				
13.25	6.82	0.71	0.00				
13.50	6.97	0.76	0.00				
13.75	7.09	0.80	0.00				
14.00	7.21	0.84	0.00				
14.25	7.32	0.88	0.00				
14.50	7.41	0.92	0.00				
14.75	7.51	0.96	0.00				
15.00	7.59	0.99	0.00				
15.25	7.67	1.02	0.00				
15.50	7.75	1.05	0.00				
15.75	7.82	1.08	0.00				
16.00	7.88	1.11	0.00				
16.25	7.93	1.13	0.00				
16.50	7.99	1.15	0.00				
16.75	8.04	1.17	0.00				
17.00	8.09	1.19	0.00				
17.25	8.13	1.21	0.00				
17.50	8.17	1.23	0.00				
17.75	8.21	1.25	0.00				

[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 6S: Driveway

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 7.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

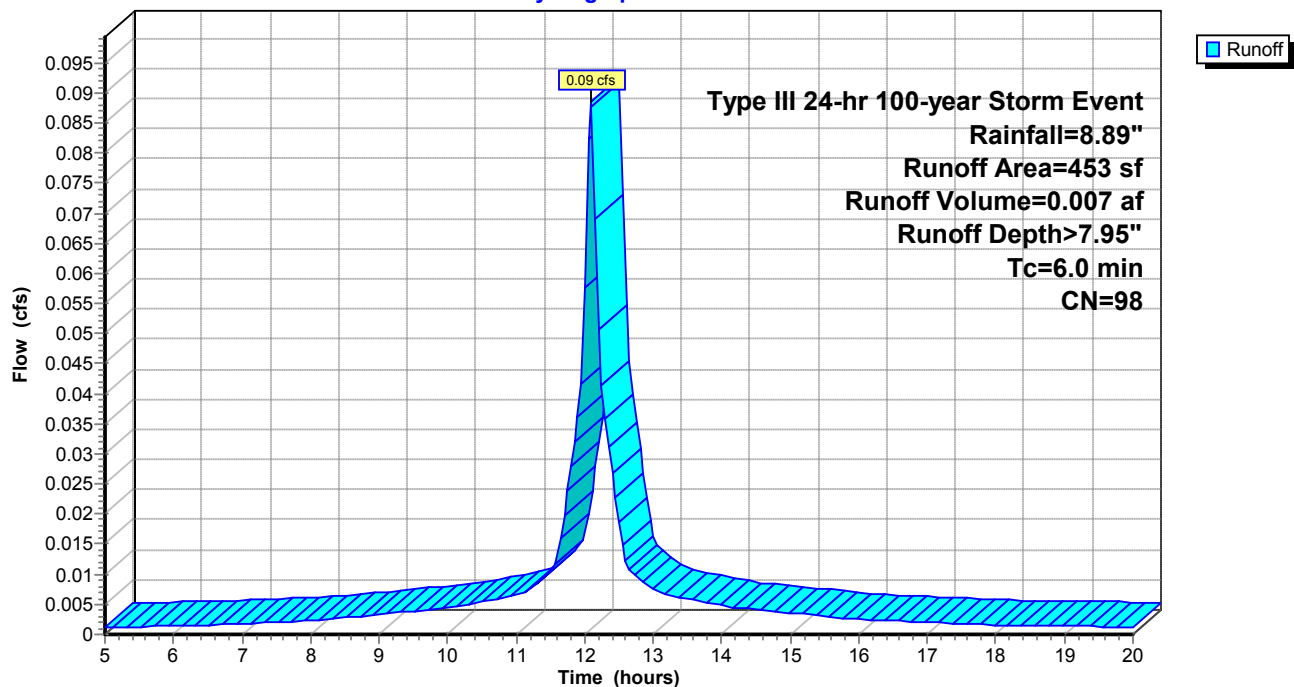
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
453	98	Paved parking & roofs
453		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Driveway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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3/26/2020

Hydrograph for Subcatchment 6S: Driveway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.32	0.00	18.00	8.25	8.01	0.00
5.25	0.54	0.35	0.00	18.25	8.29	8.05	0.00
5.50	0.57	0.38	0.00	18.50	8.32	8.08	0.00
5.75	0.60	0.41	0.00	18.75	8.35	8.11	0.00
6.00	0.64	0.45	0.00	19.00	8.39	8.15	0.00
6.25	0.68	0.48	0.00	19.25	8.42	8.18	0.00
6.50	0.72	0.52	0.00	19.50	8.45	8.21	0.00
6.75	0.76	0.56	0.00	19.75	8.48	8.24	0.00
7.00	0.80	0.60	0.00	20.00	8.51	8.27	0.00
7.25	0.85	0.65	0.00				
7.50	0.90	0.70	0.00				
7.75	0.96	0.75	0.00				
8.00	1.01	0.80	0.00				
8.25	1.07	0.86	0.00				
8.50	1.14	0.93	0.00				
8.75	1.22	1.00	0.00				
9.00	1.30	1.08	0.00				
9.25	1.38	1.16	0.00				
9.50	1.48	1.26	0.00				
9.75	1.57	1.35	0.00				
10.00	1.68	1.46	0.00				
10.25	1.80	1.57	0.00				
10.50	1.92	1.70	0.01				
10.75	2.07	1.84	0.01				
11.00	2.22	2.00	0.01				
11.25	2.41	2.18	0.01				
11.50	2.65	2.42	0.01				
11.75	3.16	2.93	0.02				
12.00	4.44	4.21	0.06				
12.25	5.73	5.49	0.04				
12.50	6.24	6.00	0.02				
12.75	6.48	6.24	0.01				
13.00	6.67	6.43	0.01				
13.25	6.82	6.58	0.01				
13.50	6.97	6.73	0.01				
13.75	7.09	6.86	0.01				
14.00	7.21	6.97	0.00				
14.25	7.32	7.08	0.00				
14.50	7.41	7.18	0.00				
14.75	7.51	7.27	0.00				
15.00	7.59	7.35	0.00				
15.25	7.67	7.43	0.00				
15.50	7.75	7.51	0.00				
15.75	7.82	7.58	0.00				
16.00	7.88	7.64	0.00				
16.25	7.93	7.69	0.00				
16.50	7.99	7.75	0.00				
16.75	8.04	7.80	0.00				
17.00	8.09	7.85	0.00				
17.25	8.13	7.89	0.00				
17.50	8.17	7.93	0.00				
17.75	8.21	7.97	0.00				

[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 7S: Walkway

Runoff = 0.02 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 7.95"

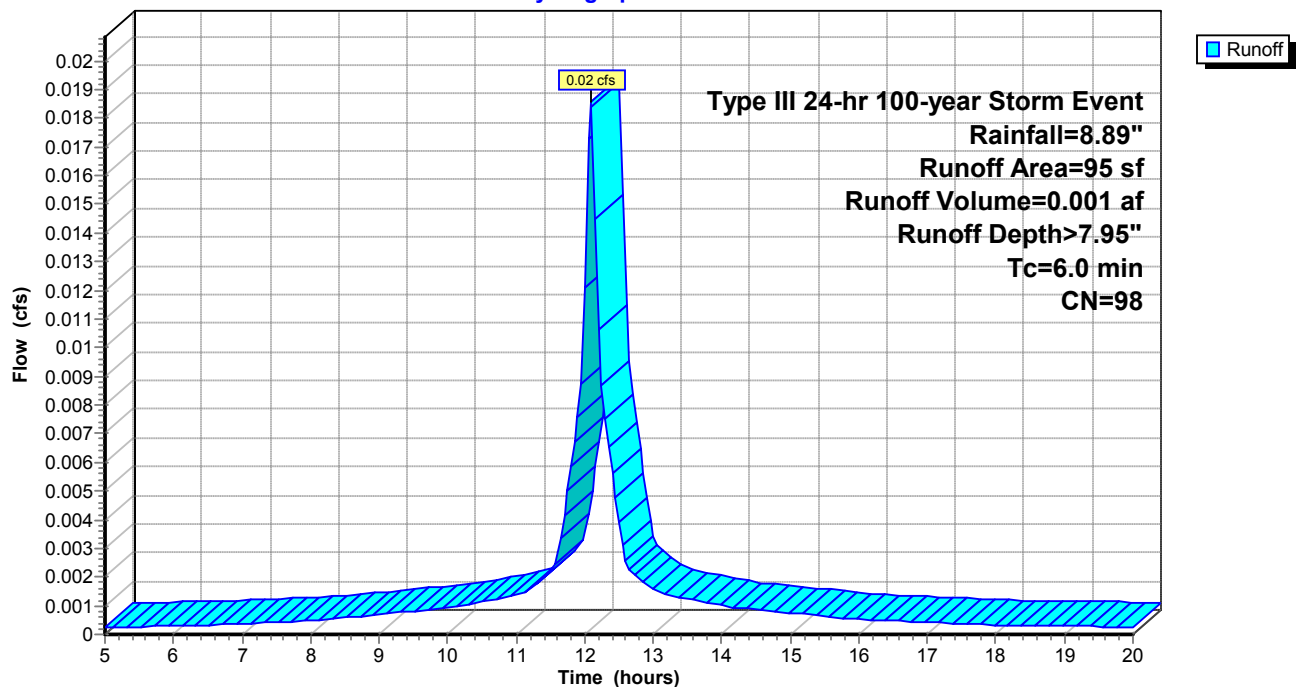
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
95	98	Paved parking & roofs
95		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.32	0.00	18.00	8.25	8.01	0.00
5.25	0.54	0.35	0.00	18.25	8.29	8.05	0.00
5.50	0.57	0.38	0.00	18.50	8.32	8.08	0.00
5.75	0.60	0.41	0.00	18.75	8.35	8.11	0.00
6.00	0.64	0.45	0.00	19.00	8.39	8.15	0.00
6.25	0.68	0.48	0.00	19.25	8.42	8.18	0.00
6.50	0.72	0.52	0.00	19.50	8.45	8.21	0.00
6.75	0.76	0.56	0.00	19.75	8.48	8.24	0.00
7.00	0.80	0.60	0.00	20.00	8.51	8.27	0.00
7.25	0.85	0.65	0.00				
7.50	0.90	0.70	0.00				
7.75	0.96	0.75	0.00				
8.00	1.01	0.80	0.00				
8.25	1.07	0.86	0.00				
8.50	1.14	0.93	0.00				
8.75	1.22	1.00	0.00				
9.00	1.30	1.08	0.00				
9.25	1.38	1.16	0.00				
9.50	1.48	1.26	0.00				
9.75	1.57	1.35	0.00				
10.00	1.68	1.46	0.00				
10.25	1.80	1.57	0.00				
10.50	1.92	1.70	0.00				
10.75	2.07	1.84	0.00				
11.00	2.22	2.00	0.00				
11.25	2.41	2.18	0.00				
11.50	2.65	2.42	0.00				
11.75	3.16	2.93	0.01				
12.00	4.44	4.21	0.01				
12.25	5.73	5.49	0.01				
12.50	6.24	6.00	0.00				
12.75	6.48	6.24	0.00				
13.00	6.67	6.43	0.00				
13.25	6.82	6.58	0.00				
13.50	6.97	6.73	0.00				
13.75	7.09	6.86	0.00				
14.00	7.21	6.97	0.00				
14.25	7.32	7.08	0.00				
14.50	7.41	7.18	0.00				
14.75	7.51	7.27	0.00				
15.00	7.59	7.35	0.00				
15.25	7.67	7.43	0.00				
15.50	7.75	7.51	0.00				
15.75	7.82	7.58	0.00				
16.00	7.88	7.64	0.00				
16.25	7.93	7.69	0.00				
16.50	7.99	7.75	0.00				
16.75	8.04	7.80	0.00				
17.00	8.09	7.85	0.00				
17.25	8.13	7.89	0.00				
17.50	8.17	7.93	0.00				
17.75	8.21	7.97	0.00				

[1120] Proposed Conditions2

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 12.12 hrs, Volume= 0.000 af, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

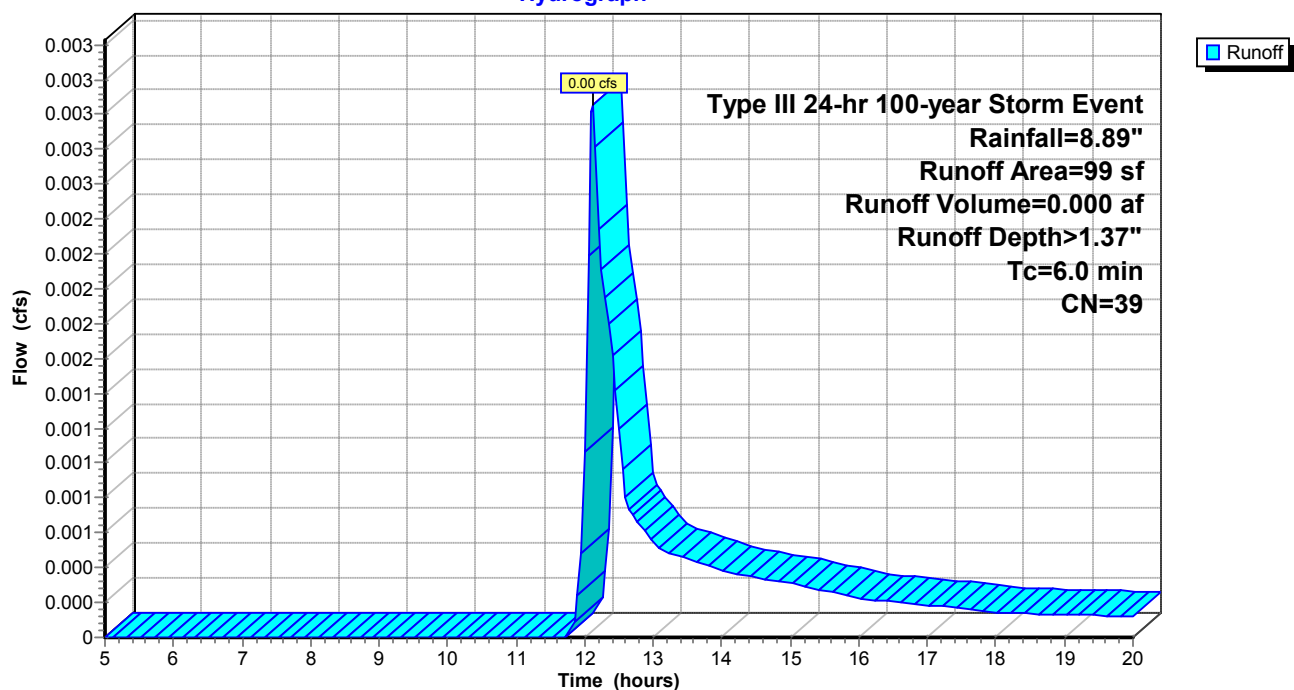
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	1.26	0.00
5.25	0.54	0.00	0.00	18.25	8.29	1.28	0.00
5.50	0.57	0.00	0.00	18.50	8.32	1.29	0.00
5.75	0.60	0.00	0.00	18.75	8.35	1.31	0.00
6.00	0.64	0.00	0.00	19.00	8.39	1.32	0.00
6.25	0.68	0.00	0.00	19.25	8.42	1.34	0.00
6.50	0.72	0.00	0.00	19.50	8.45	1.35	0.00
6.75	0.76	0.00	0.00	19.75	8.48	1.36	0.00
7.00	0.80	0.00	0.00	20.00	8.51	1.38	0.00
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.00	0.00				
8.00	1.01	0.00	0.00				
8.25	1.07	0.00	0.00				
8.50	1.14	0.00	0.00				
8.75	1.22	0.00	0.00				
9.00	1.30	0.00	0.00				
9.25	1.38	0.00	0.00				
9.50	1.48	0.00	0.00				
9.75	1.57	0.00	0.00				
10.00	1.68	0.00	0.00				
10.25	1.80	0.00	0.00				
10.50	1.92	0.00	0.00				
10.75	2.07	0.00	0.00				
11.00	2.22	0.00	0.00				
11.25	2.41	0.00	0.00				
11.50	2.65	0.00	0.00				
11.75	3.16	0.00	0.00				
12.00	4.44	0.10	0.00				
12.25	5.73	0.37	0.00				
12.50	6.24	0.52	0.00				
12.75	6.48	0.59	0.00				
13.00	6.67	0.65	0.00				
13.25	6.82	0.71	0.00				
13.50	6.97	0.76	0.00				
13.75	7.09	0.80	0.00				
14.00	7.21	0.84	0.00				
14.25	7.32	0.88	0.00				
14.50	7.41	0.92	0.00				
14.75	7.51	0.96	0.00				
15.00	7.59	0.99	0.00				
15.25	7.67	1.02	0.00				
15.50	7.75	1.05	0.00				
15.75	7.82	1.08	0.00				
16.00	7.88	1.11	0.00				
16.25	7.93	1.13	0.00				
16.50	7.99	1.15	0.00				
16.75	8.04	1.17	0.00				
17.00	8.09	1.19	0.00				
17.25	8.13	1.21	0.00				
17.50	8.17	1.23	0.00				
17.75	8.21	1.25	0.00				

[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 4.59" for 100-year Storm Event event
 Inflow = 0.02 cfs @ 12.09 hrs, Volume= 0.002 af
 Outflow = 0.01 cfs @ 11.80 hrs, Volume= 0.002 af, Atten= 77%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.80 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.74' @ 12.51 hrs Surf.Area= 0 sf Storage= 16 cf

Plug-Flow detention time= 16.5 min calculated for 0.002 af (100% of inflow)
 Center-of-Mass det. time= 16.2 min (766.3 - 750.0)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	16 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	16

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 11.80 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions2

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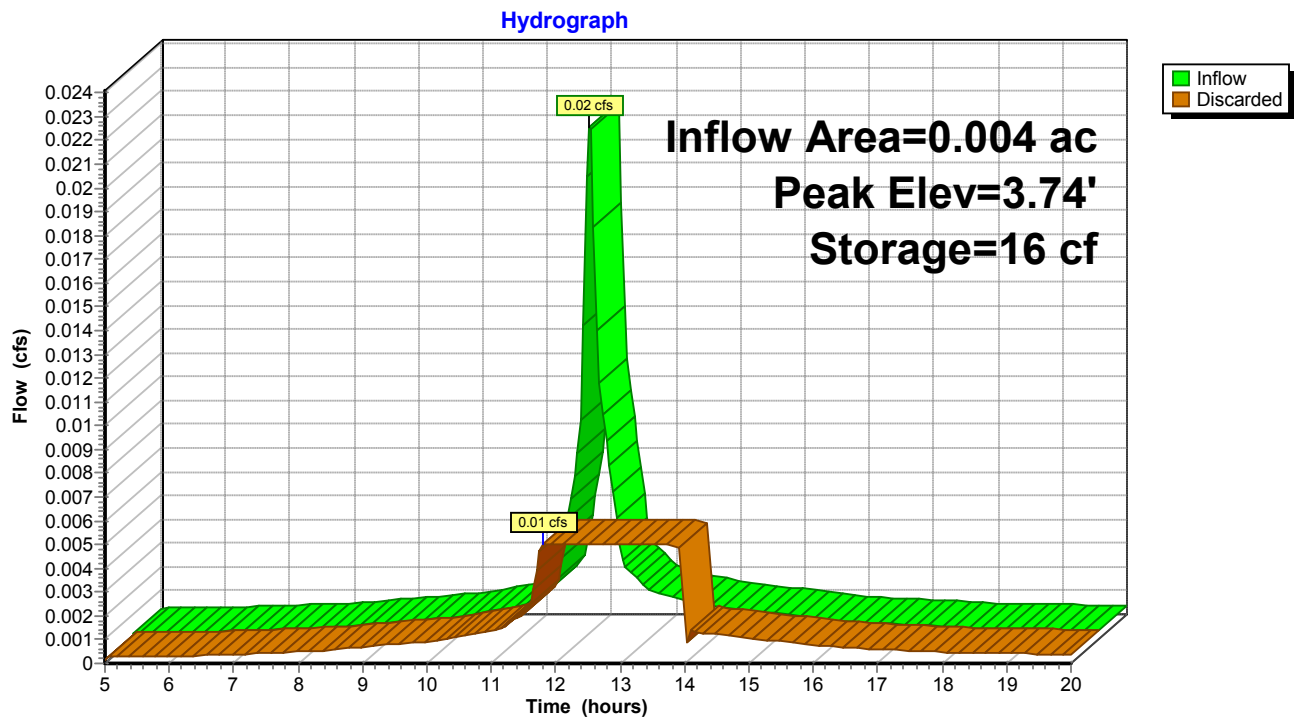
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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions2*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.00	0	3.25	0.00
11.00	0.00	0	3.25	0.00
11.50	0.00	0	3.25	0.00
12.00	0.01	3	3.34	0.01
12.50	0.01	16	3.74	0.01
13.00	0.00	12	3.63	0.01
13.50	0.00	6	3.45	0.01
14.00	0.00	0	3.26	0.00
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

[1120] Proposed Conditions2

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.013 ac, Inflow Depth > 6.59" for 100-year Storm Event event
 Inflow = 0.09 cfs @ 12.09 hrs, Volume= 0.007 af
 Outflow = 0.03 cfs @ 11.80 hrs, Volume= 0.007 af, Atten= 73%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.80 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.64' @ 12.44 hrs Surf.Area= 0 sf Storage= 59 cf

Plug-Flow detention time= 11.5 min calculated for 0.007 af (100% of inflow)
 Center-of-Mass det. time= 11.3 min (748.9 - 737.6)

Volume	Invert	Avail.Storage	Storage Description
#1	3.25'	75 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.25	0
3.75	75

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.25 3.26 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 11.80 hrs HW=3.26' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions2

Prepared by Gala Simon Associates

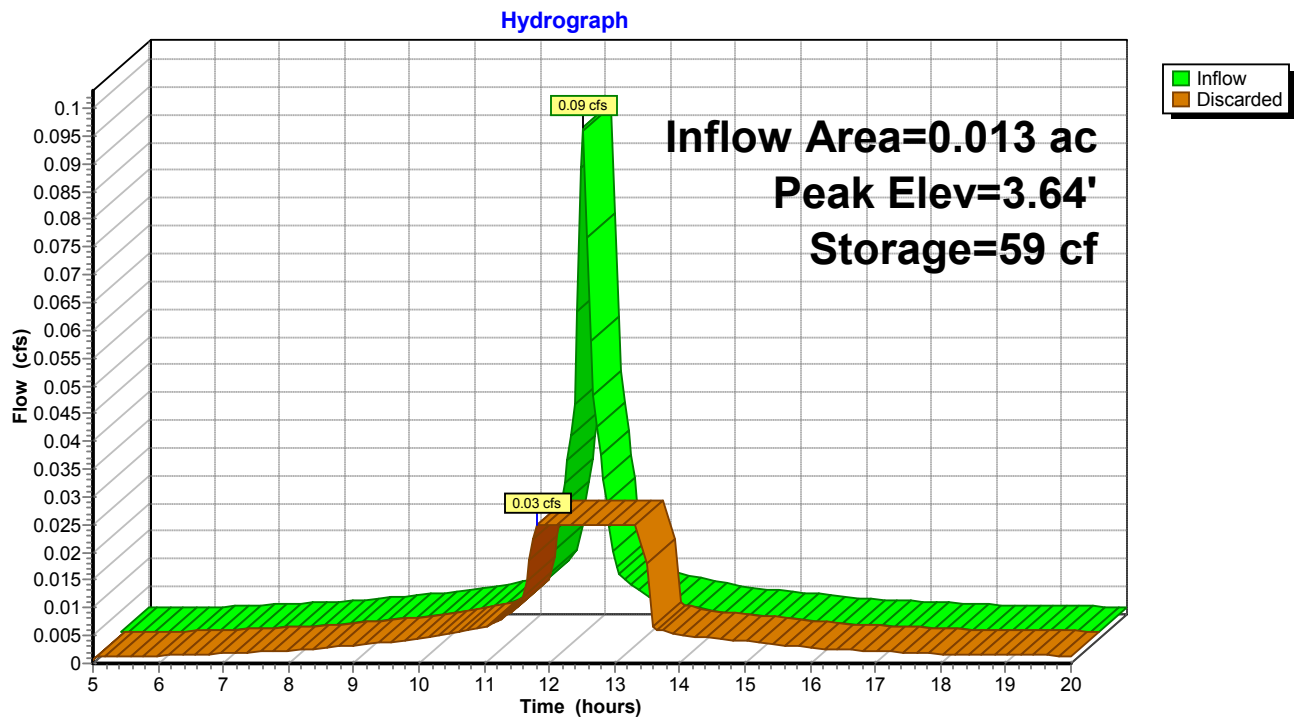
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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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3/26/2020

Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions2*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.25	0.00
5.50	0.00	0	3.25	0.00
6.00	0.00	0	3.25	0.00
6.50	0.00	0	3.25	0.00
7.00	0.00	0	3.25	0.00
7.50	0.00	0	3.25	0.00
8.00	0.00	0	3.25	0.00
8.50	0.00	0	3.25	0.00
9.00	0.00	0	3.25	0.00
9.50	0.00	0	3.25	0.00
10.00	0.00	0	3.25	0.00
10.50	0.01	0	3.25	0.01
11.00	0.01	0	3.25	0.01
11.50	0.01	1	3.25	0.01
12.00	0.06	12	3.33	0.03
12.50	0.02	58	3.64	0.03
13.00	0.01	34	3.48	0.03
13.50	0.01	2	3.26	0.03
14.00	0.01	0	3.25	0.01
14.50	0.00	0	3.25	0.00
15.00	0.00	0	3.25	0.00
15.50	0.00	0	3.25	0.00
16.00	0.00	0	3.25	0.00
16.50	0.00	0	3.25	0.00
17.00	0.00	0	3.25	0.00
17.50	0.00	0	3.25	0.00
18.00	0.00	0	3.25	0.00
18.50	0.00	0	3.25	0.00
19.00	0.00	0	3.25	0.00
19.50	0.00	0	3.25	0.00
20.00	0.00	0	3.25	0.00

***Operation
and
Maintenance
of
Drainage Systems***

Operation and Maintenance Plan for Drainage Systems

Project Name: 105 Lafayette Street, Arlington, MA

Date: March 26, 2020

Site Location: 105 Lafayette Street
Arlington, Massachusetts

Site Operator:

Owner: Lori Philbin
Contact: 781-646-4101

The following Operation and Maintenance Plan (O & M Plan) has been developed to comply with DEP's Stormwater Management Policy. The responsibilities outlined in the O&M Plan run with ownership of the property.

Pervious Pavement

- Control of sediment is important to maintain the permeability of pervious pavements.
- The performance of the pavements shall be verified by the in-field test methodology described in ASTM C-1701 upon completion of paving activities.

Ensure proper operation of Porous Pavements

- Keep silt and debris from entering onto the pervious pavements
- Pavements shall not be sealed under any circumstances
- Sand or other abrasives for snow or ice conditions shall not be used as they reduce permeability of the pavements
- Observe the pavement surface for signs of sediment or organic debris accumulation
- Use high performance, regenerative air vacuum equipment to clean surfaces. Mechanical brooms shall not be used.

Semiannually inspection for proper functioning and look for:

- Standing water on pavement surface.
- Ruts or deformations in pavement exceeding ½".
- Small random cracks should not be sealed.
- Surrounding vegetation is to be well kept to prevent sedimentation to runoff onto pavements.

Construction Period Erosion and Sediment Control

Prior to start of construction the following measures will need to be in place:

- Stake erosion control barrier on the locations shown on the site plan.
- Contact Engineer for a pre-construction meeting and inspection of the erosion control barrier.
- Install the stabilized construction entrance at the beginning of the driveway to prevent sediment from entering the roadway. Sweep roadway daily during the site construction period and end of day activities. No sediment shall be left on roadway.
- After every major storm event and on a weekly basis, verify erosion control barrier is held in place properly and sediment is retained. Remove accumulated sediment and replace barrier as needed.

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 105 Lafayette Street
MassDEP File # 091-0322
UNDER THE WETLANDS PROTECTION ACT and ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

DOCUMENTS REVIEWED

1. Notice of Intent Packet for 105 Lafayette Street, Arlington, MA prepared by LEC Environmental Consultants, Inc., dated April 20, 2020.
2. Grading/Drainage Plan and Detail Page for 105 Lafayette Street, prepared by Gala Simon Associates, Inc., stamped by Alberto Gala PE #36434, dated February 27, 2012, revised May 11, 2020.
3. Engineering Drainage Calculations and Stormwater Operation and Maintenance Plan for 105 Lafayette Street Arlington MA, prepared by Gala Simon Associates, Inc., stamped by Alberto Gala PE #36434, dated March 26, 2020.

PROCEEDINGS

The Conservation Commission held a public hearing for the Notice of Intent on May 7, 2020. The hearing was closed on May 7, 2020. The Commission deliberated on May 21, 2020 and voted **x-x-x to approve** the Project with conditions under the Wetlands Protection Act (the "Act") and voted **x-x-x to approve** the Project with conditions under the Arlington Wetlands Protection Bylaw (the "Bylaw").

**FINDINGS OF FACT AND LAW
UNDER ARLINGTON WETLANDS PROTECTION BYLAW
AND WETLANDS PROTECTION ACT**

- A. The project as approved involves: (1) razing an existing house; (2) constructing a new house; and (3) constructing associated site appurtenances including a porous pavement driveway and walkway.
- B. The project site is approximately 4,839 square feet containing a residential unit located at 105 Lafayette Street in Arlington, Massachusetts. The site is developed with a residential home.
- C. The following Resource Areas are present on the site or within 100 feet of the lot lines: Bordering Vegetated Wetlands, Adjacent Upland Resource Area ("AURA") (Bylaw), 100-ft Buffer Zone (Act), 200-ft Riverfront Area, Bordering Land Subject to Flooding, Floodway, and Floodplain, and Alewife Brook. The Commission finds accurate the delineation of Resource Areas shown on the approved plan for 105 Lafayette Street.
- D. The work proposes to raze the existing 1,101 square foot house and impervious driveway, and construct a 1,398 square foot house with porous pavement driveway and walkway. This project will create a total net reduction of 98 square feet of impervious surface onsite.
- E. In order to meet FEMA Building Code requirements, and in order to comply with compensatory flood storage requirements enumerated in the Act and Bylaw, the proposed dwelling will be constructed atop a crawl-space foundation. Seven (7) flood vents will be installed in the foundation walls to allow for flood water to ebb and flow as needed during anticipated flooding associated with the 0.1% annual chance flood. While 538 cubic feet of BLSF will be displaced due to the project, minor grading and the proposed foundation with flood vents will provide approximately 2,856 cubic feet of compensatory flood storage, a total increase of approximately 2,318 square feet of compensatory flood storage; which is an improvement

Comment [e1]: PH: I think it should be 109 rather than 98, subtracting the sheds from the Pre- and Post Impervious area table on the plan

Comment [e2]: ES: 98 is the calculation the Applicant listed on their revised plan

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 105 Lafayette Street
MassDEP File # 091-0322
UNDER THE WETLANDS PROTECTION ACT AND ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

over existing conditions and more than complies with the Bylaw requirement of 2:1 compensatory flood storage.

- F. As mitigation, this project proposes to provide stormwater management to mitigate for any potential impacts to resource areas, including two 50+ gallon rain barrels located off the rear house corners, and a porous pavement driveway and walkway. The project also proposes to improve the existing site conditions by planting 12 native plants onsite.
- G. Based on the testimony at the public hearing, and review of the application materials and the documents listed above submitted during the public hearing, the Commission concludes that the proposed Project ~~will not alter Resource Areas under the Act and Bylaw, the work~~ as conditioned will not have significant or cumulative effects upon the interests of the Wetlands Protection Act or the Resource Area values of the Arlington Wetlands Bylaw when the conditions imposed are implemented to protect the Resource Area values. With the conditions contained herein, the Project meets the performance standards in the Bylaw Regulations and State Wetlands Regulations, 310 CMR 10.00.

Additional Special Conditions

In addition to the General Conditions (numbered 1 – 20 above), the Project is subject to the following Additional Special Conditions (under both the Act and Bylaw):

Pre-Construction

21. Work permitted by this Order and Permit shall conform to the Notice of Intent, the approved plans and documents (listed above), and oral representations (as recorded in hearing minutes) submitted or made by the Applicant and the Applicant's agents or representatives, as well as any plans and other data, information or representations submitted per these Conditions and approved by the Commission.
22. The provisions of this Order and Permit shall apply to and be binding upon the Applicant and Applicant's assignees, tenants, property management company, employees, contractors, and agents.
23. No work shall begin under this Order until: (a) all other required permits or approvals have been obtained and (b) the appeal period of ten (10) business days from the date of issue of this Order has expired without any appeal being filed, and (c) this Order has been recorded in the Registry of Deeds.
24. The Applicant shall ensure that a copy of this Order of Conditions and Permit for work, with any referenced plans, is available on site at all times, and that contractors, site managers, foremen, and sub-contractors understand its provisions.
25. Prior to starting work, the Applicant shall submit to the Commission the names and 24-hour phone numbers of project managers or the persons responsible for site work or mitigation.
26. Before work begins, erosion and sediment controls shall be installed at the limits of the work area. These will include 12 inch compost filter tubes around the entire work area (hay bales are not allowed and silt socks are preferred).

Comment [e3]: PH: Possibly add new condition: Any conditions resulting from review by others pursuant to FEMA and State Building Code compliance for building in the 100-year flood zone are herein incorporated by reference.

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 105 Lafayette Street
MassDEP File # 091-0322
UNDER THE WETLANDS PROTECTION ACT and ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

27. The contractor shall contact the Conservation Agent (concomm@town.arlington.ma.us ; 781-316-3012) to arrange for a pre-construction meeting with the on-site project manager to walk through the Order of Conditions and walk the site to confirm the installation and placement of erosion controls prior to the start of any grading or construction work.
28. The contractor shall provide written Notice of the work start date to the Conservation Agent 48 hours prior to start of work.
29. The 1% Annual Flood Chance Hazard Floodplain boundary shall be staked prior to construction and the pre-construction meeting with the Conservation Agent. The Conservation Agent shall review the staking during the pre-construction meeting. The floodplain boundary stakes shall remain intact for the entire duration of the project.
30. The Commission, its employees, and its agents shall have the right of entry onto the site to inspect for compliance with the terms of this Order of Conditions and Permit until a Certificate of Compliance has been issued.

Post-Construction

31. When requesting a Certificate of Compliance for this Order of Conditions, the Applicant must submit a written statement from a either (1) Massachusetts professional engineer and registered land surveyor, or (2) registered land surveyor and landscape architect certifying that the completed work complies with the plans referenced in this Order, or provide an as-built plan and statement describing any differences.

Dumpsters

32. All dumpsters must be covered at the end of each work day, and no dumpsters will be allowed overnight within the 100 foot Buffer Zone or Adjacent Upland Resource Areas ("AURA") or other Resource Areas.

Stockpiling

33. No uncovered stockpiling of materials shall be permitted overnight within 100 feet of any waterway or water body. Stockpiling shall occur only where noted on approved plans.

Erosion Control

34. Areas that are disturbed by construction and access activities shall as soon as possible be brought to final grade and reseeded and restabilized, and shall be done so prior to the removal of erosion control barriers.
35. Erosion control measures shall be installed per the approved plans and confirmed during the pre-construction inspection.

Equipment

36. No heavy equipment may be stored overnight within 50 feet of the wetland and no refueling or maintenance of machinery shall be allowed within the 100-foot Buffer Zone, 200-foot Resource Area, and Adjacent Upland Resource Area or within any Resource Area.

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 105 Lafayette Street
MassDEP File # 091-0322
UNDER THE WETLANDS PROTECTION ACT and ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

37. Construction entrances shall be used and maintained only where noted on approved plans.
38. Arrangements shall be made for any rinsing of tools, equipment, etc. associated with on-site mixing or use of concrete or other materials such that the waste water is disposed of in the concrete wash out station at least 50 feet from the resource area. In no case may water be discharged into or onto Resource Areas on or adjacent to the site. Any spillage of materials shall be cleaned up promptly.

Comment [e4]: PH: wonder if this needs to be clarified since BSLF covers much of the site and you cannot get 50 feet away from it on-site

Sweeping

39. Any dirt or debris spilled or tracked onto any paved streets shall be swept up and removed daily.

Plantings

40. The 12 native shrubs proposed in this project shall be planted anywhere on the property, and but not on adjacent publicly owned land.
41. The project shall include the replacement of the existing topsoil with new topsoil to grade, as a mitigation strategy for controlling invasive plants that are currently on site.
42. All plantings shall be native and be installed and maintained according to the standards of the American Association of Nurserymen (AAN). **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition.**
43. All plantings planted through this project shall be maintained for three years. A survival rate of at least 75% must be maintained for the approved plantings. **The Conservation Agent shall be contacted by the Property Owner to conduct annual inspections of the plantings sometime between September 15- November 1 2021, 2022, and 2023.**

Chemicals

44. To avoid adding excess nitrogen runoff to Spy Pond/Alewife Brook, the Applicant shall only treat the lawn with slow release nitrogen fertilizer. Application of this fertilizer cannot occur in the summer, or after storm events. Lawn fertilizer shall only be applied twice a year, in spring and fall. No herbicides shall be used to treat invasive or unwanted plants. New plantings shall only be fertilized once, during the initial planting year. No pesticides or rodenticides shall be used to treat pest management issues within the Wetland Buffers Zone, Riverfront Area, or Floodplain. **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.**

Pervious Surfaces

45. Pervious surfaces shown on the project plans shall be maintained and not be replaced by impervious surfaces. **This shall be a continuing condition that survives the expiration of the permit and shall be included in any Certificate of Compliance as a continuing condition.**
46. The porous pavement shall be installed and maintained per the manufacturer's specifications, as outlined in the Operations and Maintenance Plan for Drainage Systems, included in Engineering

Comment [e5]: PH: a new condition should be added and become standard for porous pavement. Something to the effect: A Statement of Compliance shall be stamped, signed and dated by the designer that the porous pavement/stormwater management system has been constructed in accordance with the approved design.

ARLINGTON CONSERVATION COMMISSION
APPROVAL ORDER OF CONDITIONS – 105 Lafayette Street
MassDEP File # 091-0322
UNDER THE WETLANDS PROTECTION ACT and ARLINGTON BYLAW FOR WETLANDS PROTECTION
5/21/2020

Drainage Calculations and Stormwater Operation and Maintenance Plan for 105 Lafayette Street
Arlington MA, prepared by Gala Simon Associates, Inc., stamped by Alberto Gala PE #36434, dated
March 26, 2020. **This shall be a continuing condition that survives the expiration of the permit and
shall be included in any Certificate of Compliance as a continuing condition in perpetuity.**

47. The Conservation Agent shall conduct inspections of the porous pavement driveway and walkway
during the following stages of construction: 1) when the areas have been excavated, and 2) when the
base materials have been installed.

Fill and Excavation

48. This project shall not increase the water surface in the floodplain. At the project's completion, the site
must conform to the elevations and compensatory flood storage outlined on the revised plans dated
May 11, 2020. **This shall be a continuing condition that survives the expiration of the permit and
shall be included in any Certificate of Compliance as a continuing condition.**

Stormwater

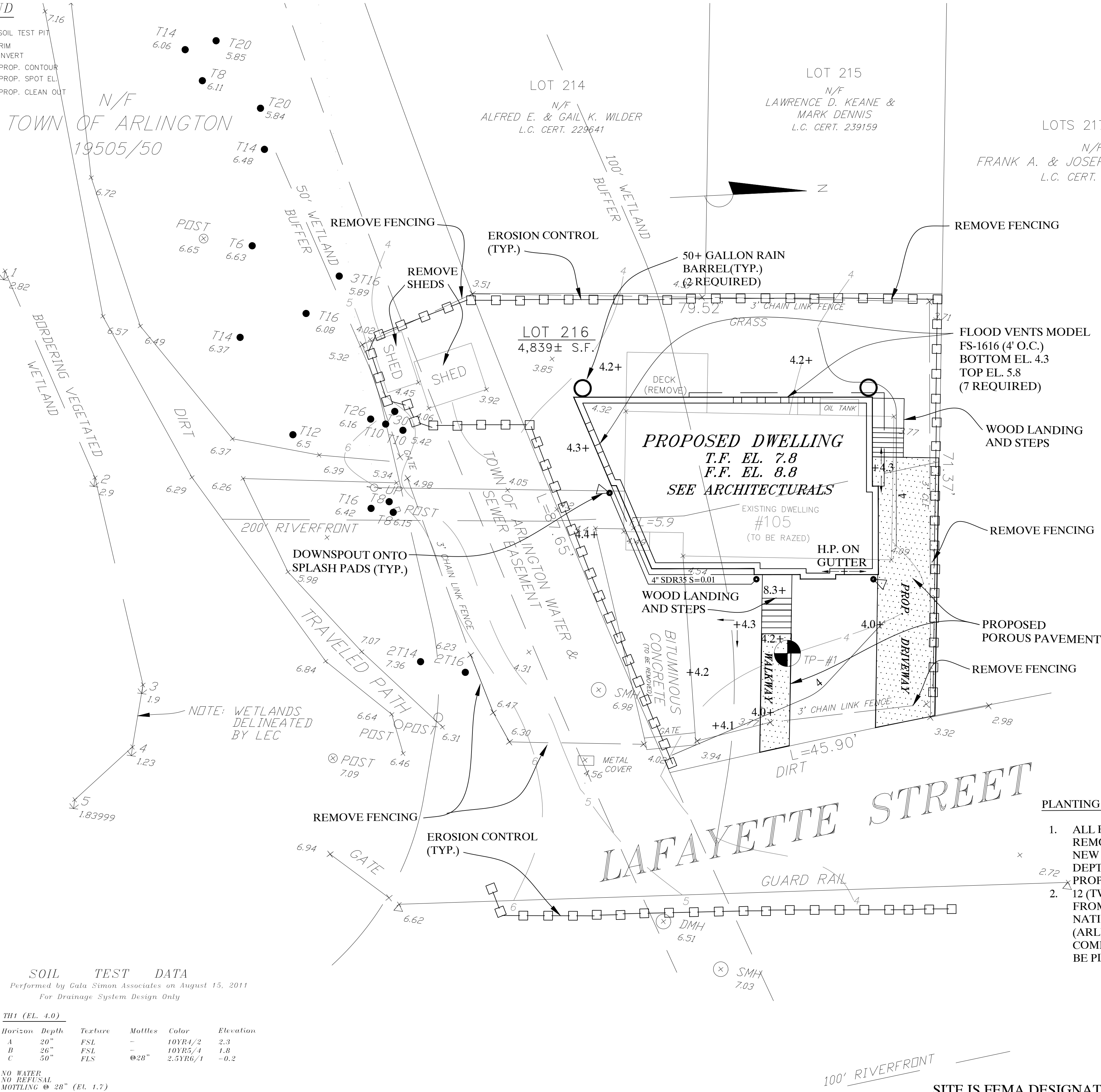
49. The Applicant shall protect all adjacent catch basins using silt socks.

[Fence Removal](#)

50. [The fence on the property line adjacent to the publicly-owned land will be removed.](#)

LEGEND

- TP
R
I
98
+99.7
C.O.
- SOIL TEST PIT
RIM
INVERT
PROP. CONTOUR
PROP. SPOT EL.
PROP. CLEAN OUT



SOIL TEST DATA

Performed by Gala Simon Associates on August 15, 2011
For Drainage System Design Only

TH1 (EL. 4.0)					
Horizon	Depth	Texture	Mottles	Color	Elevation
A	20"	FSL	-	10YR4/2	2.3
B	26"	FSL	-	10YR5/4	1.8
C	50"	FLS	0.28"	2.5YR6/1	-0.2
NO WATER NO REFUSAL MOTTLING 0.28" (EL. 1.7)					

Existing Flood Storage			Proposed Flood Storage		
El.	Area (s.f.)	Volume (c.f.)	El.	Area (s.f.)	Volume (c.f.)
4.0	1649	2714	4.0	1292	4688
5.0	3779	3779	5.0	4688	4688
6.0	3779	3779	6.0	4688	4688
7.0	3779	3779	7.0	4688	4688

FLOOD STORAGE CALCULATIONS WITHIN PROPERTY

NOTE: CALCULATIONS FOR FLOOD STORAGE UNDER PROPOSED CONDITIONS WERE PERFORMED INCLUDING THE TOTAL VOLUME ENTERING THE FOUNDATION THROUGH THE VENTS.
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SITE PLAN

SCALE: 1" = 10'

Filled Flood Storage			Compensatory Flood Storage		
El.	Area (s.f.)	Volume (c.f.)	El.	Area (s.f.)	Volume (c.f.)
4.0	475	298	4.0	952	952
5.0	120	120	5.0	952	952
6.0	120	120	6.0	952	952
7.0	120	120	7.0	952	952

FLOOD FILL/COMP. CALCULATIONS

NOTE: COMPENSATORY VOLUMES CALCULATED IN AREAS NOT PREVIOUSLY CONSIDERED FLOODPLAIN INITIAL ELEVATION AT 4.0 FOR SIMPLIFICATION

TOWN OF ARLINGTON
ENGINEERING DIVISION
INSPECTION SIGN OFF:

1. BOTTOM OF BEDS	INSPECTOR	DATE
2. POST INSTALLATIONS PRIOR TO BACKFILL	INSPECTOR	DATE

STORM EVENT	EXISTING CONDITIONS PEAK		PROPOSED CONDITIONS PEAK	
	Runoff (cfs)	Volume (af)	Runoff (cfs)	Volume (af)
2-year (3.23 in)	0.02	0.003	0.02	0.003
10-year (4.90 in)	0.11	0.009	0.11	0.008
25-year (6.20 in)	0.21	0.015	0.20	0.014
100-year (8.89 in)	0.46	0.031	0.41	0.027

PRE VS. POST IMPERVIOUS AREAS

RUNOFF SURFACE	EXISTING (SF)	PROPOSED (SF)	
ROOF	1,101	1,398	
DRIVEWAY	394	0*	453 S.F.(POROUS PAVERS)
WALKWAY	0	0*	148 S.F.(POROUS PAVERS)
TOTAL	1,496	1,398	

RIVERFRONT IMPERVIOUS AREAS

EXISTING (SF)	PROPOSED (SF)
816	523

GENERAL NOTES

- EXISTING CONDITIONS SURVEY INFORMATION OBTAINED FROM ROBER SURVEY, ARLINGTON, MA. OWNER/CLIENT ASSUMES ALL RESPONSIBILITY FOR SOURCES AND AUTHORIZATION TO USE ELECTRONIC AND RECORD FILES.
- THE CONTRACTOR SHALL VERIFY ALL EXISTING INFORMATION ON THE GROUND AND SHALL REPORT ALL DISCREPANCIES TO THE ENGINEER IMMEDIATELY FOR A DECISION PRIOR TO CONSTRUCTION.
- ALL AREAS OUTSIDE OF THE LIMIT OF WORK LINES SHALL NOT BE DISTURBED IN ANY MANNER BY THE CONTRACT OPERATIONS. THE CONTRACTOR SHALL KEEP OUT OF THESE AREAS AND PRESERVE THEIR EXISTING CHARACTER.
- INSTALL TEMPORARY EROSION CONTROL MEASURES PRIOR TO CONSTRUCTION FOR APPROVAL BY THE DESIGN ENGINEER AND CONSERVATION COMMISSION.
- PROVIDE SMOOTH TRANSITION AT CHANGES IN GRADE EXCEPT AS INDICATED ON THE DRAWINGS AND AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNDERGROUND UTILITY LINES: ACTIVE OR NOT, AND SHALL MAINTAIN A CLOSE AND CONSTANT CONTACT WITH ALL UTILITY COMPANIES INVOLVED. CALL DIG-SAFE 888-344-7233 THE TOWN OF ARLINGTON WATER AND SEWER DIVISION IS NOT A MEMBER OF DIGSAFE.
- ALL ELEVATIONS ARE REFERENCED TO NAVD 1988 DATUM.
- CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS, PERMITTING, AND LICENSES ISSUED AT THE FEDERAL, STATE AND LOCAL AGENCIES.
- CONTRACTOR SHALL COORDINATE ALL SITE UTILITY IMPROVEMENTS WITH THE TOWN OF ARLINGTON OFFICIALS.
- ENGINEER IS TO BE CONTACTED BY CONTRACTOR TO PERFORM AS BUILT MEASUREMENTS.
- OWNER/DEVELOPER IS TO COMPLY WITH ALL OF MASSACHUSETTS DEP SITE DEVELOPMENT REGULATIONS.
- ROADWAY IS TO BE SWEEPED, OR OTHERWISE CLEANED OF DEBRIS AND SEDIMENT, AT THE END OF EACH WORKDAY.
- CONTRACTOR IS TO COORDINATE INSPECTIONS OF THE SUBSURFACE DRAINAGE SYSTEM WITH THE TOWN OF ARLINGTON ENGINEERING DIVISION. ONE INSPECTION WILL BE REQUIRED FOR THE BOTTOM OF THE BED AND ANOTHER AFTER INSTALLATION AND PRIOR TO BACKFILLING. ENGINEERING DIVISION REQUIRES 24 HOURS ADVANCE NOTICE.
- ADDITIONAL PERMITTING WILL BE REQUIRED THROUGH THE ARLINGTON ENGINEERING DIVISION FOR PROPOSED CUT AND CAP ACTIVITIES, WATER SERVICE INSTALLATION, SEWER SERVICE INSTALLATION, AND CURB CUT WORK.
- AN AS-BUILT PLAN OF THE SURFACE DRAINAGE SYSTEM AND ANY IMPERVIOUS AREAS ON SITE SHALL BE PROVIDED TO THE TOWN OF ARLINGTON ENGINEERING DIVISION FOLLOWING INSTALLATION. THIS PLAN SHALL INCLUDE SWING TIES, ELEVATIONS, AND OFFSETS.
- THE CONTRACTOR IS TO PROVIDE A FIELD AS-BUILT SKETCH, TO THE ENGINEERING DIVISION AT THE TIME OF INSPECTIONS.
- SHOULD SUBSURFACE CONDITIONS VARY FROM THOSE IN THE TEST HOLES, THE DESIGN ENGINEER SHALL BE CONTACTED AND ANY REVISIONS TO THE STORM WATER PLAN SHALL BE SUBMITTED TO THE ENGINEERING DIVISION FOR REVIEW.
- ALL TREE ROOTS ENCOUNTERED DURING EXCAVATION SHALL BE CUT CLEANLY UNDER THE SUPERVISION /DIRECTION OF A CERTIFIED ARBORIST.
- CONTRACTOR IS TO MINIMIZE ABUTTER IMPACTS DURING DEMOLITION OF THE EXISTING DWELLING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE WITHIN OR OUTSIDE THE LIMIT OF WORK DUE TO CONTRACTOR OPERATIONS. CONTRACTOR SHALL RESTORE ANY DAMAGED AREAS TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR IS TO VERIFY DWELLING DIMENSIONS WITH ARCHITECTURAL PLANS.
- EXISTING CONTOURS PREPARED BY GSA BY INTERPOLATION OF SURVEY SPOT ELEVATIONS.

DRAINAGE NOTES:

- CONTRACTOR IS RESPONSIBLE FOR THE VERTICAL AND HORIZONTAL CONTROLS OF THE PROJECT.
- CONTRACTOR IS TO REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION OF HOUSE DOWNSPOUTS AND ELEVATIONS.
- THE MINIMUM CLEARANCE FROM THE BOTTOM OF THE POROUS PAVEMENT SYSTEMS TO REFUSAL OR GROUNDWATER IS 12 INCHES.
- IN THE EVENT THAT THIS CLEARANCE CANNOT BE MAINTAINED, ENGINEER IS TO BE NOTIFIED.
- ALL DRAINAGE PIPING IS SDR35 PVC.
- STORMWATER RUNOFF SHALL NOT BE DIRECTED ACROSS ADJACENT PROPERTY LINES.

Gala Simon Associates Inc.
394 LOWELL STREET, SUITE 18
LEXINGTON, MA 02420
Tel: (781) 676-2962

Gala Simon Associates

GSA

Civil Engineers

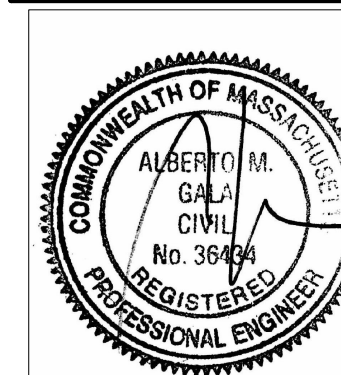
GRADING/DRAINAGE

PLAN

105 LAFAYETTE STREET

ARLINGTON, MASSACHUSETTS

Job No. 1120		Date: 5/27/12
Drawn By: TG		Scale: AS SHOWN
Rev#	Date:	Description:
1	5/23/13	House
2	3/26/20	House
3	5/11/20	per CC



C-0

UTILITY NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THIS PLAN, PRIOR TO ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BEFORE PROCEEDING WITH THE WORK.

THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES SUCH AS CATCH BASINS, MANHOLES, WATERGATES, ETC. AND COMPILED FROM PLANS SUPPLIED BY VARIOUS UTILITY COMPANIES AND GOVERNMENT AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, ALL UTILITY COMPANIES OR AGENCIES PRIOR TO ANY EXCAVATION WORK. CALL DIG-SAFE AT 1-888-344-7233

CALL THE TOWN OF ARLINGTON WATER AND SEWER DIVISION AT 781-316-3310 FOR A MARKOUT. THE TOWN OF ARLINGTON WATER AND SEWER DIVISION IS NOT A MEMBER OF DIG-SAFE.

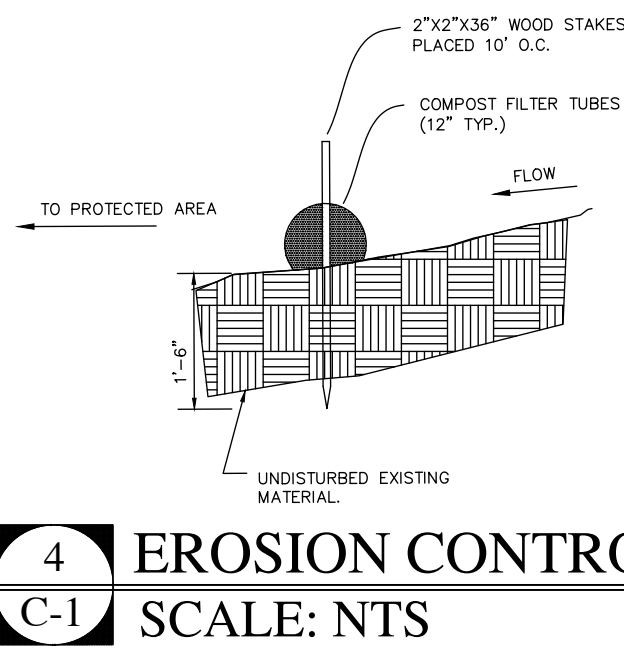
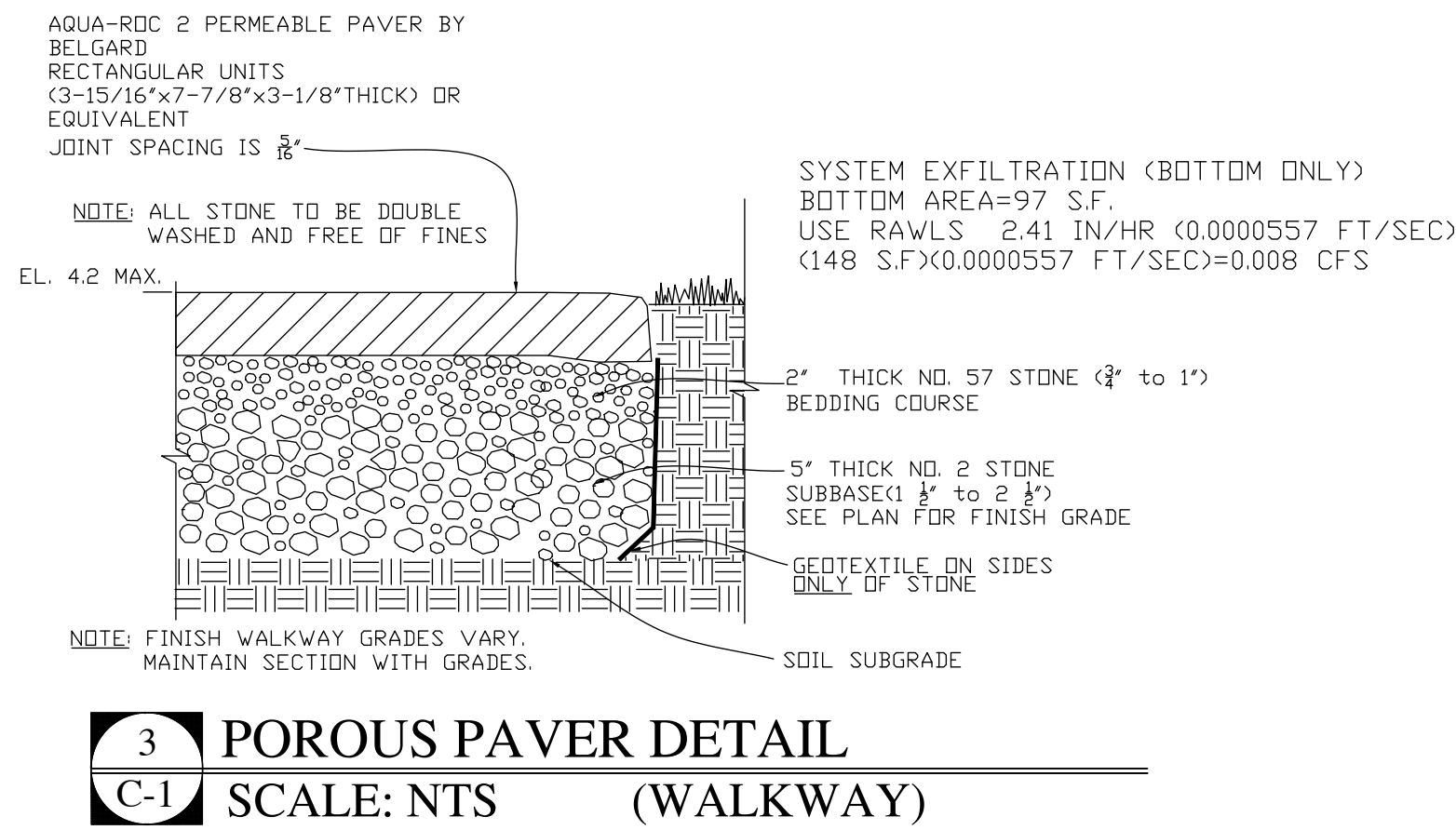
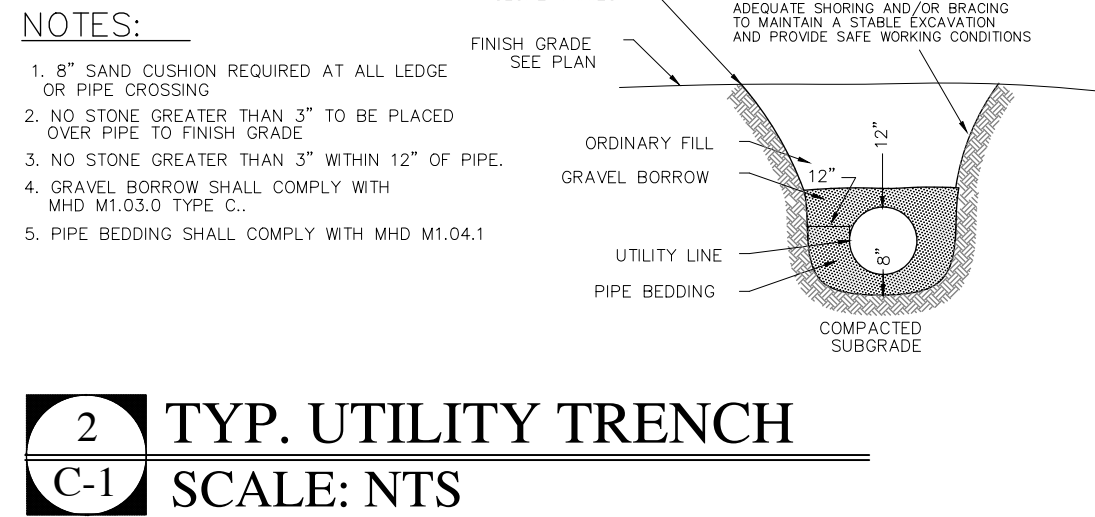
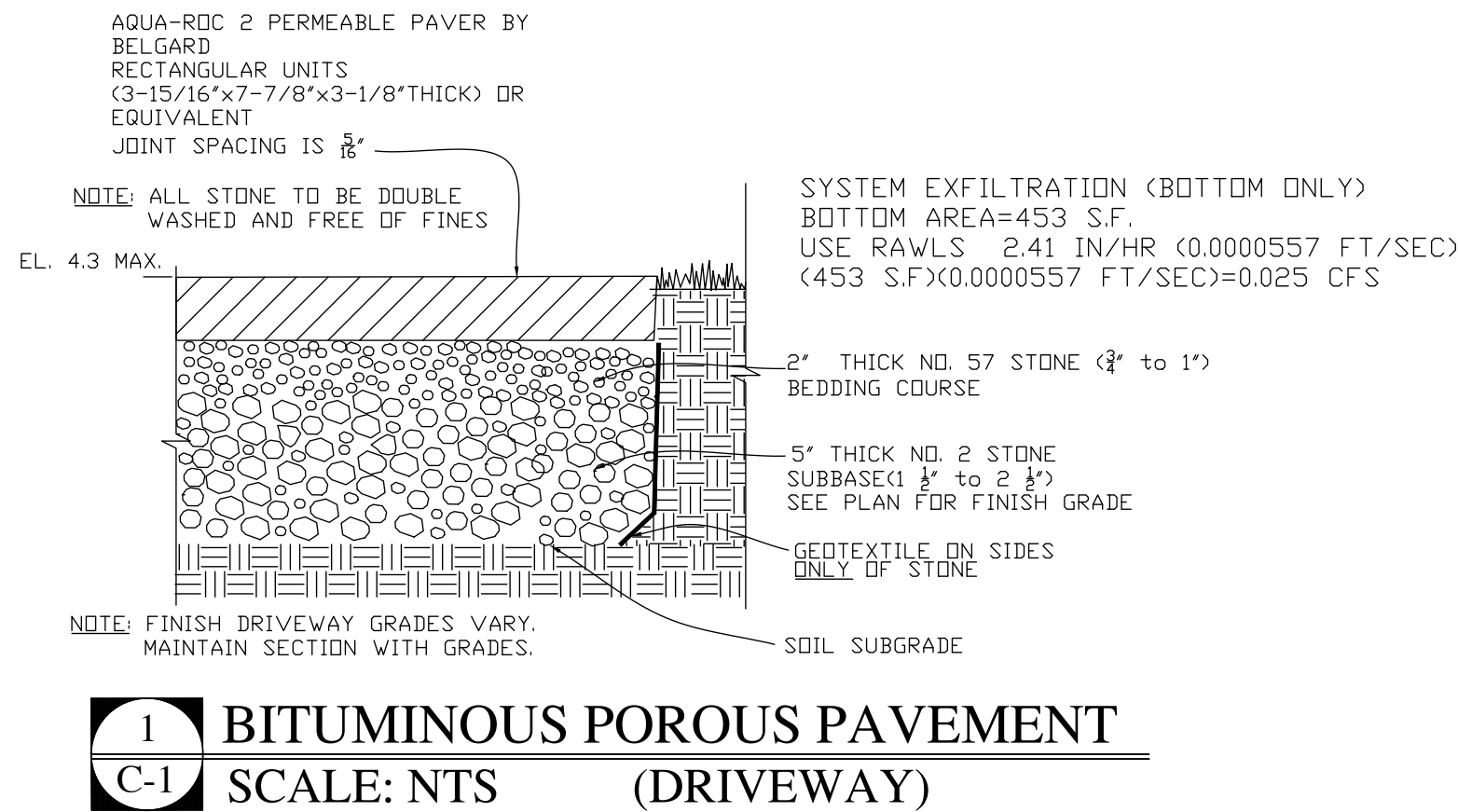
ADDITIONAL PERMITTING WILL BE REQUIRED THROUGH THE ARLINGTON ENGINEERING DIVISION FOR PROPOSED CUT AND CAP ACTIVITIES, WATER SERVICE INSTALLATION, SEWER SERVICE INSTALLATION, AND CURB CUT WORK.

AS BUILT NOTE:

CONTRACTOR IS TO CONTACT ENGINEER FOR AS-BUILT MEASUREMENTS .

LAYOUT & GRADING NOTES

1. CONSULT ALL DRAWINGS AND SPECIFICATIONS FOR COORDINATION REQUIREMENTS BETWEEN ALL TRADES PRIOR TO COMMENCING NEW CONSTRUCTION.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL CONTACT THE PROPER AUTHORITIES IN WRITING TO CONFIRM THE LOCATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE INCURRED DURING CONSTRUCTION TO ANY UTILITY SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
3. CONTRACTOR TO REFER TO A SURVEYOR PLOT PLAN FOR ACCURATE OFFSETS TO TO PROPERTY LINE.



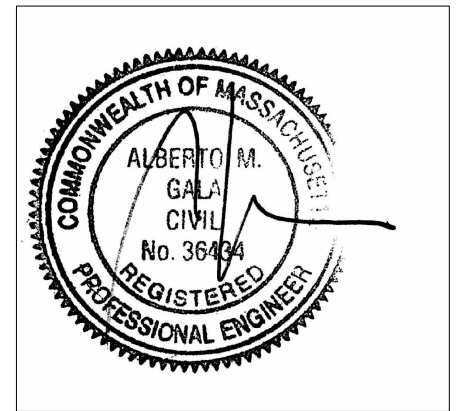
Gala Simon Associates Inc.
394 LOWELL STREET, SUITE 18
LEXINGTON, MA 02420
Tel: (781) 676-2962



DETAILS

105 LAFAYETTE STREET
ARLINGTON, MASSACHUSETTS

Job No. 1120		Date: 5/27/12
Drawn By: TG		Scale: AS SHOWN
Rev#	Date:	Description:
1	5/23/13	House
2	3/26/20	House
3	5/11/20	per CC



***Engineering Drainage Calculations
for
105 Lafayette Street
Arlington, Massachusetts***

Prepared by

***Gala Simon Associates, Inc.
394 Lowell Street, Suite 18
Lexington, MA 02420
781-676-2962***

***March 26, 2020
Revised May 11, 2020***



Project: 105 Lafayette Street, Arlington, MA

Date: March 26, 2020
Revised May 11, 2020

Project Narrative:

The project consists of the construction of a new dwelling in the general vicinity as the existing dwelling to be demolished. Porous pavement is proposed for the walkway and driveway, to capture runoff from the proposed partial roof area and partial front lawn area.

Soils on the site are considered Hydrological Soil Type A per USDA soil maps. On-site soil testing performed by Gala Simon Associates, Inc., on August 15, 2011 indicate loamy sandy soils (group A) on-site.

The 24-hour rainfall amounts used in the hydrological calculations were obtained from the Northeast Regional Climate Center's, "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada".

Summary of Results:

The following table summarizes the peak flows and volumes from the property under Existing and Proposed Conditions.

Summary of Stormwater Runoff and Volume

<i>Storm Event</i>	<i>Existing Conditions Peak</i>		<i>Proposed Conditions Peak</i>		<i>Δ</i>	
	<i>Runoff (cfs)</i>	<i>Volume (af)</i>	<i>Runoff (cfs)</i>	<i>Volume (af)</i>	<i>Runoff (cfs)</i>	<i>Volume (af)</i>
<i>2-Year (3.23 in)</i>	0.02	0.003	0.02	0.003	0.00	0.000
<i>10-Year (4.90 in)</i>	0.11	0.009	0.11	0.008	0.00	-0.001
<i>25-Year (6.20 in)</i>	0.21	0.015	0.20	0.014	-0.01	-0.001
<i>100-Year (8.89 in)</i>	0.46	0.031	0.41	0.027	-0.05	-0.004

Conclusions:

1. As analyzed, the peak rates of runoff and volumes will be maintained for the 2, 10, 25 and 100 year storm events.

Project: **105 Lafayette Street, Arlington**

Date: *March 26, 2020*
Revised May 11, 2020

Existing Conditions

Total Area:	4,839 s.f.
Total Impervious Area:	1,496 s.f.
Total Lawn Area:	3,343 s.f.

Hydrocad Model for Existing Conditions:

Total Area:	4,839 s.f.
Impervious:	1,496 s.f.
Lawn Area:	3,343 s.f.

Hydrocad Model for Proposed Conditions

Total Area:	4,839 s.f.
	Impervious: 1,999 s.f.
	Lawn: 2,840 s.f.
Area into Porous Pavers:	968 s.f.
	Impervious: 626 s.f.
	Lawn: 342 s.f.
Remainder of Land:	3,871 s.f.
	Impervious: 1,373 s.f.
	Lawn: 2,498 s.f.

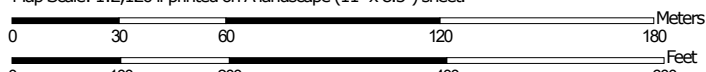
The storm values were compared using the Existing Conditions node and the Proposed Conditions Remainder of Land node.

USDA
Soil Mapping

Hydrologic Soil Group—Middlesex County, Massachusetts



Map Scale: 1:2,120 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84



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**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

5/11/2020
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
 Survey Area Data: Version 19, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		0.4	1.9%
52A	Freetown muck, 0 to 1 percent slopes	B/D	3.1	16.3%
602	Urban land		0.6	3.1%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	4.1	21.4%
655	Udorthents, wet substratum		10.9	57.4%
Totals for Area of Interest			19.0	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

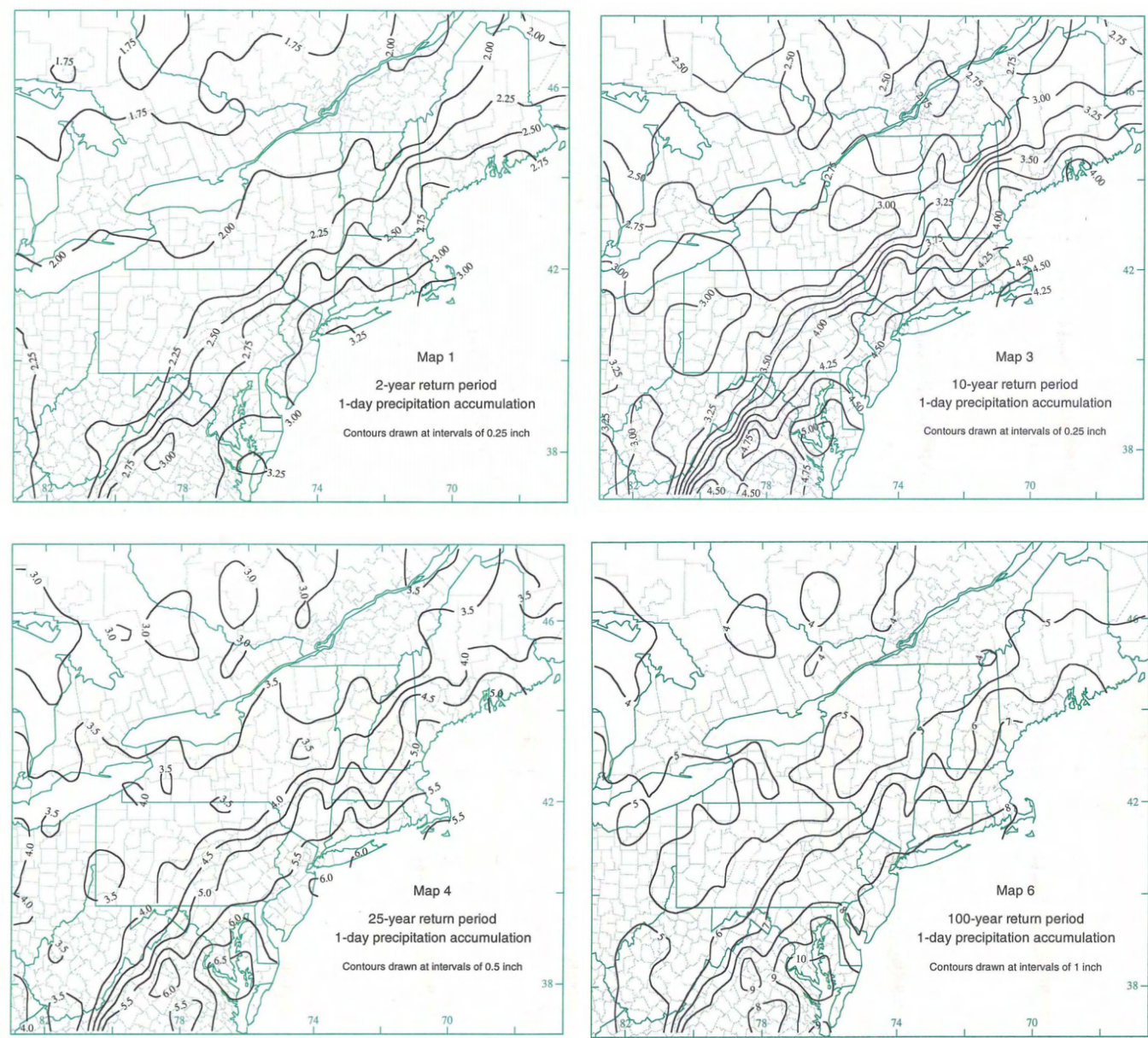
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

*Atlas
of
Precipitation Extremes*

24-hour rainfall amounts obtained from the Northeast Regional Climate Center, “Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada.”

24-Hour Storm Event	Rainfall (inches)
2-year	3.23
10-year	4.90
25-year	6.20
100-year	8.89



Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.142 degrees West
Latitude	42.399 degrees North
Elevation	0 feet
Date/Time	Mon, 11 May 2020 18:22:30 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.70	0.87	1.10	1yr	0.75	1.04	1.28	1.63	2.09	2.69	2.94	1yr	2.38	2.83	3.29	3.98	4.65	1yr
2yr	0.35	0.54	0.67	0.88	1.11	1.40	2yr	0.96	1.28	1.62	2.04	2.57	3.23	3.59	2yr	2.86	3.45	3.95	4.70	5.35	2yr
5yr	0.42	0.65	0.81	1.09	1.39	1.78	5yr	1.20	1.61	2.06	2.60	3.26	4.09	4.56	5yr	3.62	4.39	5.00	5.97	6.69	5yr
10yr	0.47	0.74	0.93	1.27	1.65	2.12	10yr	1.43	1.91	2.48	3.12	3.92	4.90	5.47	10yr	4.33	5.26	5.99	7.16	7.92	10yr
25yr	0.56	0.89	1.13	1.56	2.07	2.68	25yr	1.79	2.41	3.14	3.97	4.98	6.20	6.96	25yr	5.49	6.69	7.59	9.10	9.91	25yr
50yr	0.63	1.02	1.30	1.83	2.46	3.22	50yr	2.12	2.86	3.78	4.79	5.99	7.42	8.36	50yr	6.57	8.04	9.09	10.92	11.75	50yr
100yr	0.73	1.18	1.52	2.15	2.93	3.85	100yr	2.53	3.41	4.53	5.74	7.18	8.89	10.04	100yr	7.87	9.65	10.88	13.10	13.93	100yr
200yr	0.84	1.36	1.77	2.53	3.49	4.62	200yr	3.01	4.06	5.44	6.91	8.62	10.65	12.07	200yr	9.42	11.60	13.04	15.73	16.53	200yr
500yr	1.01	1.66	2.17	3.14	4.40	5.86	500yr	3.79	5.11	6.93	8.80	10.98	13.53	15.40	500yr	11.97	14.81	16.57	20.05	20.73	500yr

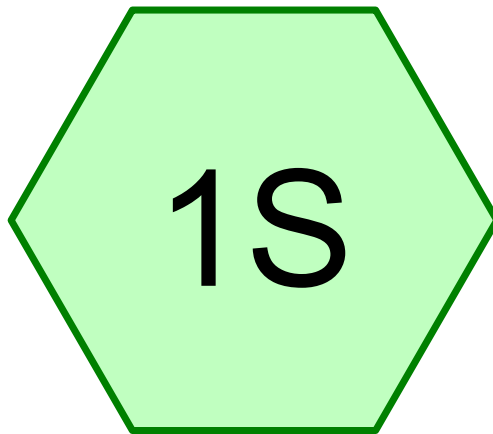
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.38	0.46	0.62	0.76	0.85	1yr	0.66	0.83	1.15	1.44	1.78	2.45	2.51	1yr	2.17	2.42	2.94	3.53	4.09	1yr
2yr	0.33	0.51	0.63	0.85	1.05	1.26	2yr	0.91	1.23	1.45	1.92	2.48	3.13	3.47	2yr	2.77	3.34	3.82	4.54	5.19	2yr
5yr	0.39	0.60	0.75	1.03	1.31	1.51	5yr	1.13	1.48	1.73	2.25	2.89	3.78	4.19	5yr	3.34	4.03	4.59	5.48	6.17	5yr
10yr	0.44	0.67	0.83	1.16	1.50	1.73	10yr	1.30	1.69	1.95	2.53	3.25	4.36	4.84	10yr	3.86	4.65	5.27	6.30	7.01	10yr
25yr	0.51	0.77	0.96	1.37	1.80	2.05	25yr	1.55	2.01	2.31	2.97	3.79	5.24	5.83	25yr	4.64	5.61	6.32	7.54	8.28	25yr
50yr	0.56	0.85	1.06	1.53	2.06	2.36	50yr	1.78	2.30	2.62	3.35	4.25	6.01	6.71	50yr	5.32	6.45	7.23	8.63	9.38	50yr
100yr	0.63	0.95	1.19	1.72	2.36	2.68	100yr	2.04	2.62	2.97	3.62	4.78	6.92	7.71	100yr	6.13	7.41	8.28	9.83	10.63	100yr
200yr	0.71	1.06	1.35	1.95	2.72	3.07	200yr	2.35	3.00	3.37	4.04	5.39	7.95	8.86	200yr	7.04	8.52	9.47	11.18	12.01	200yr
500yr	0.83	1.23	1.59	2.31	3.28	3.66	500yr	2.83	3.58	3.97	4.69	6.31	9.56	10.63	500yr	8.46	10.22	11.31	13.21	14.07	500yr

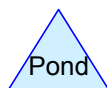
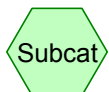
Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.58	0.79	0.97	1.13	1yr	0.83	1.11	1.33	1.77	2.26	2.86	3.17	1yr	2.53	3.05	3.51	4.28	5.03	1yr
2yr	0.36	0.56	0.69	0.94	1.16	1.36	2yr	1.00	1.33	1.57	2.08	2.69	3.35	3.74	2yr	2.97	3.59	4.11	4.88	5.55	2yr
5yr	0.45	0.70	0.87	1.19	1.51	1.79	5yr	1.30	1.75	2.06	2.66	3.39	4.43	4.99	5yr	3.92	4.80	5.42	6.48	7.21	5yr
10yr	0.55	0.84	1.05	1.46	1.89	2.21	10yr	1.63	2.16	2.56	3.23	4.07	5.50	6.24	10yr	4.87	6.00	6.71	8.04	8.82	10yr
25yr	0.71	1.09	1.35	1.93	2.54	2.91	25yr	2.19	2.84	3.41	4.17	5.19	7.30	8.41	25yr	6.46	8.08	8.89	10.74	11.54	25yr
50yr	0.86	1.32	1.64	2.35	3.17	3.60	50yr	2.74	3.52	4.22	5.06	6.24	9.05	10.53	50yr	8.01	10.12	11.00	13.40	14.15	50yr
100yr	1.06	1.60	2.00	2.89	3.97	4.44	100yr	3.42	4.34	5.25	6.40	7.49	11.24	13.21	100yr	9.95	12.70	13.62	16.74	17.39	100yr
200yr	1.29	1.94	2.46	3.56	4.96	5.48	200yr	4.28	5.36	6.52	7.82	8.99	13.96	16.58	200yr	12.36	15.94	16.89	20.93	21.40	200yr
500yr	1.68	2.50	3.22	4.67	6.64	7.23	500yr	5.73	7.07	8.71	10.21	11.46	18.61	22.42	500yr	16.47	21.56	22.44	28.19	28.21	500yr

Existing Conditions
2, 10, 25 and 100 Year Storm Events



Existing Conditions



Drainage Diagram for [1120] Existing Conditions3
Prepared by Gala Simon Associates 5/11/2020
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[1120] Existing Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

Page 1

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Subcatchment 1S: Existing Conditions

Runoff = 0.02 cfs @ 12.26 hrs, Volume= 0.003 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

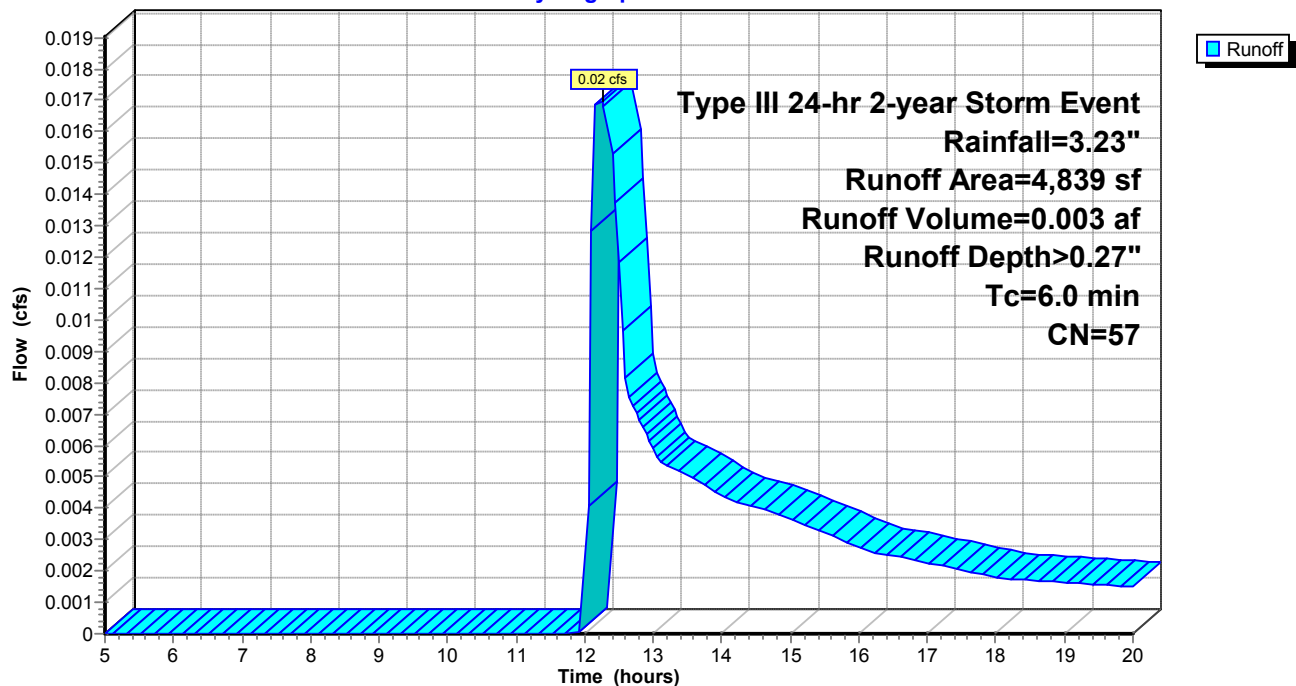
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
1,496	98	Paved parking & roofs
3,343	39	>75% Grass cover, Good, HSG A
4,839	57	Weighted Average
3,343		Pervious Area
1,496		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.25	0.00
5.25	0.20	0.00	0.00	18.25	3.01	0.25	0.00
5.50	0.21	0.00	0.00	18.50	3.02	0.25	0.00
5.75	0.22	0.00	0.00	18.75	3.03	0.26	0.00
6.00	0.23	0.00	0.00	19.00	3.05	0.26	0.00
6.25	0.25	0.00	0.00	19.25	3.06	0.26	0.00
6.50	0.26	0.00	0.00	19.50	3.07	0.27	0.00
6.75	0.28	0.00	0.00	19.75	3.08	0.27	0.00
7.00	0.29	0.00	0.00	20.00	3.09	0.27	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.00	0.00				
11.75	1.15	0.00	0.00				
12.00	1.61	0.00	0.00				
12.25	2.08	0.04	0.02				
12.50	2.27	0.07	0.01				
12.75	2.35	0.09	0.01				
13.00	2.42	0.10	0.01				
13.25	2.48	0.11	0.01				
13.50	2.53	0.12	0.01				
13.75	2.58	0.13	0.00				
14.00	2.62	0.14	0.00				
14.25	2.66	0.15	0.00				
14.50	2.69	0.16	0.00				
14.75	2.73	0.17	0.00				
15.00	2.76	0.18	0.00				
15.25	2.79	0.19	0.00				
15.50	2.82	0.19	0.00				
15.75	2.84	0.20	0.00				
16.00	2.86	0.21	0.00				
16.25	2.88	0.21	0.00				
16.50	2.90	0.22	0.00				
16.75	2.92	0.22	0.00				
17.00	2.94	0.23	0.00				
17.25	2.95	0.23	0.00				
17.50	2.97	0.24	0.00				
17.75	2.98	0.24	0.00				

[1120] Existing Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 1S: Existing Conditions

Runoff = 0.11 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

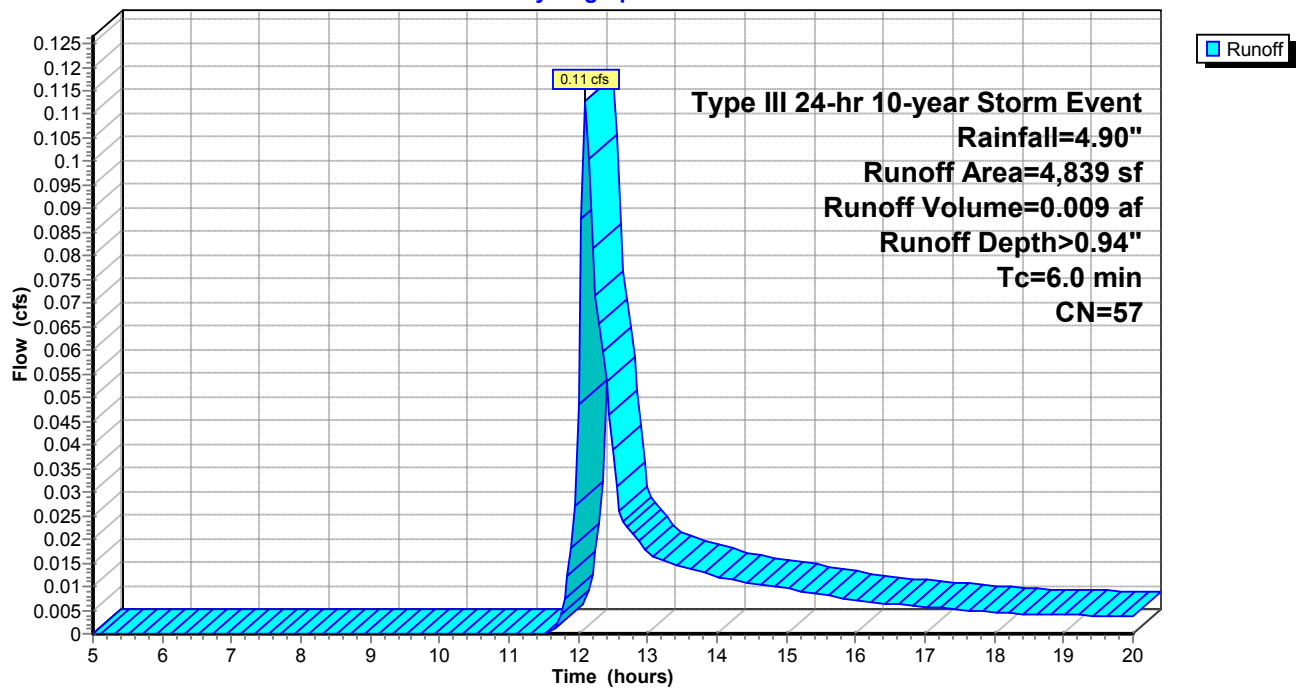
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
1,496	98	Paved parking & roofs
3,343	39	>75% Grass cover, Good, HSG A
4,839	57	Weighted Average
3,343		Pervious Area
1,496		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	0.87	0.00
5.25	0.30	0.00	0.00	18.25	4.57	0.88	0.00
5.50	0.31	0.00	0.00	18.50	4.59	0.89	0.00
5.75	0.33	0.00	0.00	18.75	4.60	0.90	0.00
6.00	0.35	0.00	0.00	19.00	4.62	0.91	0.00
6.25	0.37	0.00	0.00	19.25	4.64	0.92	0.00
6.50	0.40	0.00	0.00	19.50	4.66	0.93	0.00
6.75	0.42	0.00	0.00	19.75	4.67	0.94	0.00
7.00	0.44	0.00	0.00	20.00	4.69	0.94	0.00
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.00	0.00				
10.25	0.99	0.00	0.00				
10.50	1.06	0.00	0.00				
10.75	1.14	0.00	0.00				
11.00	1.22	0.00	0.00				
11.25	1.33	0.00	0.00				
11.50	1.46	0.00	0.00				
11.75	1.74	0.01	0.00				
12.00	2.45	0.10	0.05				
12.25	3.16	0.30	0.07				
12.50	3.44	0.39	0.04				
12.75	3.57	0.44	0.02				
13.00	3.67	0.48	0.02				
13.25	3.76	0.52	0.02				
13.50	3.84	0.55	0.01				
13.75	3.91	0.58	0.01				
14.00	3.97	0.61	0.01				
14.25	4.03	0.63	0.01				
14.50	4.09	0.66	0.01				
14.75	4.14	0.68	0.01				
15.00	4.19	0.70	0.01				
15.25	4.23	0.72	0.01				
15.50	4.27	0.74	0.01				
15.75	4.31	0.76	0.01				
16.00	4.34	0.77	0.01				
16.25	4.37	0.79	0.01				
16.50	4.40	0.80	0.01				
16.75	4.43	0.82	0.01				
17.00	4.46	0.83	0.01				
17.25	4.48	0.84	0.01				
17.50	4.50	0.85	0.01				
17.75	4.53	0.86	0.00				

[1120] Existing Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 1S: Existing Conditions

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

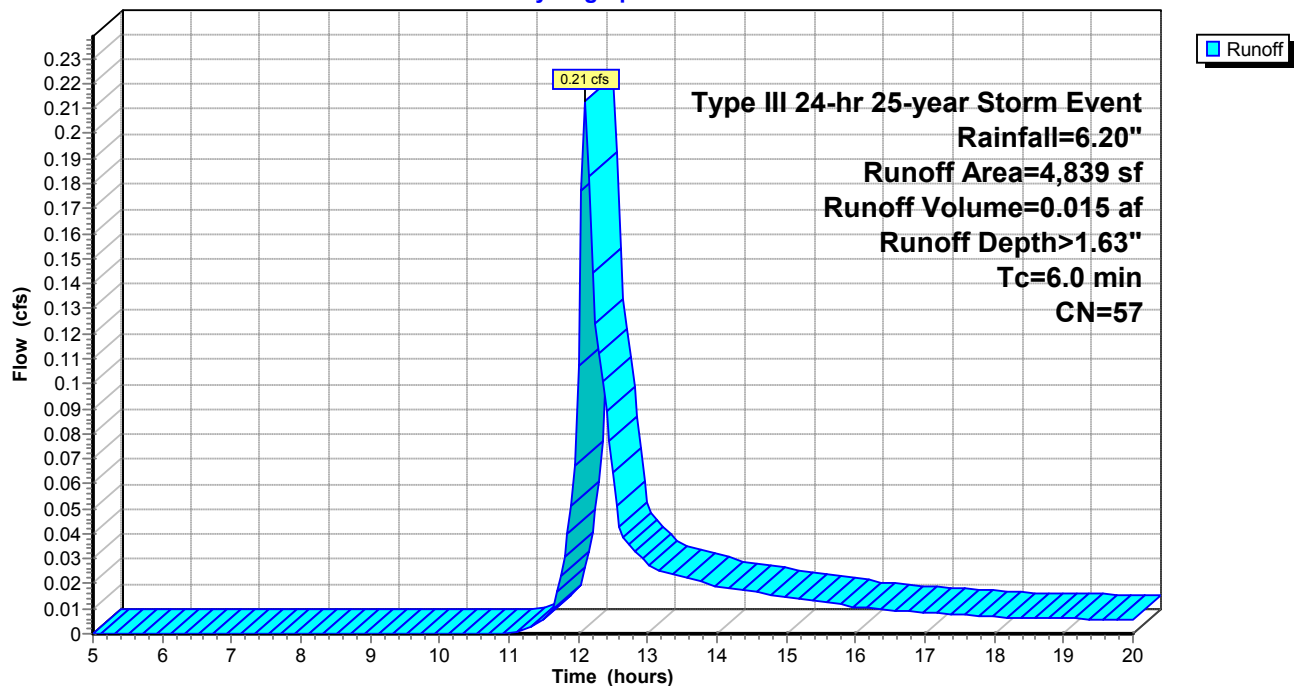
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
1,496	98	Paved parking & roofs
3,343	39	>75% Grass cover, Good, HSG A
4,839	57	Weighted Average
3,343		Pervious Area
1,496		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	1.53	0.01
5.25	0.37	0.00	0.00	18.25	5.78	1.54	0.01
5.50	0.40	0.00	0.00	18.50	5.80	1.56	0.01
5.75	0.42	0.00	0.00	18.75	5.83	1.57	0.01
6.00	0.45	0.00	0.00	19.00	5.85	1.58	0.01
6.25	0.47	0.00	0.00	19.25	5.87	1.60	0.01
6.50	0.50	0.00	0.00	19.50	5.89	1.61	0.01
6.75	0.53	0.00	0.00	19.75	5.91	1.62	0.01
7.00	0.56	0.00	0.00	20.00	5.93	1.64	0.01
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.00	0.00				
9.50	1.03	0.00	0.00				
9.75	1.10	0.00	0.00				
10.00	1.17	0.00	0.00				
10.25	1.25	0.00	0.00				
10.50	1.34	0.00	0.00				
10.75	1.44	0.00	0.00				
11.00	1.55	0.00	0.00				
11.25	1.68	0.00	0.00				
11.50	1.85	0.01	0.01				
11.75	2.20	0.06	0.02				
12.00	3.10	0.28	0.11				
12.25	4.00	0.62	0.12				
12.50	4.35	0.78	0.06				
12.75	4.52	0.86	0.04				
13.00	4.65	0.92	0.03				
13.25	4.76	0.98	0.02				
13.50	4.86	1.03	0.02				
13.75	4.95	1.08	0.02				
14.00	5.03	1.12	0.02				
14.25	5.10	1.16	0.02				
14.50	5.17	1.20	0.02				
14.75	5.24	1.23	0.02				
15.00	5.30	1.27	0.01				
15.25	5.35	1.30	0.01				
15.50	5.40	1.33	0.01				
15.75	5.45	1.35	0.01				
16.00	5.49	1.38	0.01				
16.25	5.53	1.40	0.01				
16.50	5.57	1.42	0.01				
16.75	5.61	1.44	0.01				
17.00	5.64	1.46	0.01				
17.25	5.67	1.48	0.01				
17.50	5.70	1.50	0.01				
17.75	5.73	1.51	0.01				

[1120] Existing Conditions3

Type III 24-hr 100-year Storm Event Rainfall=8.89"

Prepared by Gala Simon Associates

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Subcatchment 1S: Existing Conditions

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.031 af, Depth> 3.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

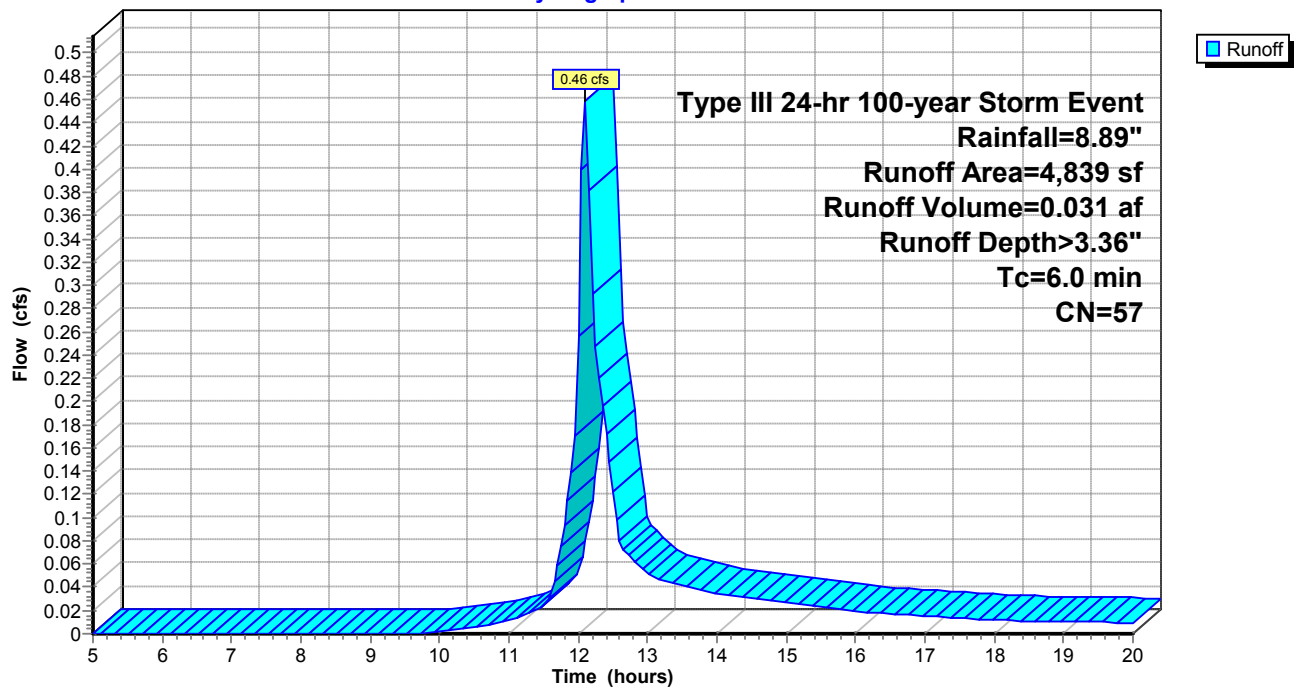
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
1,496	98	Paved parking & roofs
3,343	39	>75% Grass cover, Good, HSG A
4,839	57	Weighted Average
3,343		Pervious Area
1,496		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



[1120] Existing Conditions3

Type III 24-hr 100-year Storm Event Rainfall=8.89"

Prepared by Gala Simon Associates

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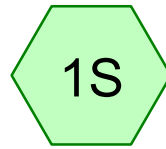
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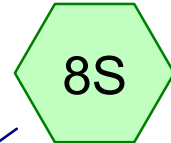
Hydrograph for Subcatchment 1S: Existing Conditions

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	3.18	0.01
5.25	0.54	0.00	0.00	18.25	8.29	3.21	0.01
5.50	0.57	0.00	0.00	18.50	8.32	3.23	0.01
5.75	0.60	0.00	0.00	18.75	8.35	3.26	0.01
6.00	0.64	0.00	0.00	19.00	8.39	3.28	0.01
6.25	0.68	0.00	0.00	19.25	8.42	3.30	0.01
6.50	0.72	0.00	0.00	19.50	8.45	3.32	0.01
6.75	0.76	0.00	0.00	19.75	8.48	3.35	0.01
7.00	0.80	0.00	0.00	20.00	8.51	3.37	0.01
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.00	0.00				
8.00	1.01	0.00	0.00				
8.25	1.07	0.00	0.00				
8.50	1.14	0.00	0.00				
8.75	1.22	0.00	0.00				
9.00	1.30	0.00	0.00				
9.25	1.38	0.00	0.00				
9.50	1.48	0.00	0.00				
9.75	1.57	0.00	0.00				
10.00	1.68	0.00	0.00				
10.25	1.80	0.01	0.00				
10.50	1.92	0.02	0.01				
10.75	2.07	0.04	0.01				
11.00	2.22	0.06	0.01				
11.25	2.41	0.10	0.02				
11.50	2.65	0.15	0.03				
11.75	3.16	0.30	0.08				
12.00	4.44	0.82	0.26				
12.25	5.73	1.52	0.25				
12.50	6.24	1.82	0.12				
12.75	6.48	1.97	0.07				
13.00	6.67	2.10	0.05				
13.25	6.82	2.20	0.05				
13.50	6.97	2.29	0.04				
13.75	7.09	2.38	0.04				
14.00	7.21	2.45	0.03				
14.25	7.32	2.53	0.03				
14.50	7.41	2.59	0.03				
14.75	7.51	2.66	0.03				
15.00	7.59	2.72	0.03				
15.25	7.67	2.77	0.02				
15.50	7.75	2.82	0.02				
15.75	7.82	2.87	0.02				
16.00	7.88	2.91	0.02				
16.25	7.93	2.95	0.02				
16.50	7.99	2.99	0.02				
16.75	8.04	3.03	0.02				
17.00	8.09	3.06	0.02				
17.25	8.13	3.10	0.01				
17.50	8.17	3.13	0.01				
17.75	8.21	3.15	0.01				

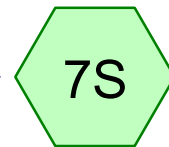
***Proposed Conditions
2, 10, 25 and 100 Year Storm Events***



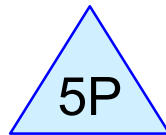
Remainder of Land



Lawn



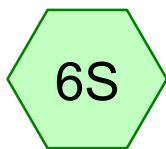
Walkway



Porous Paver
(Walkway)



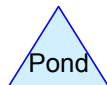
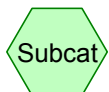
Lawn



Impervious Area



Porous Paver
(Driveway)



Drainage Diagram for [1120] Proposed Conditions3

Prepared by Gala Simon Associates 5/11/2020

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[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Subcatchment 1S: Remainder of Land

Runoff = 0.02 cfs @ 12.14 hrs, Volume= 0.003 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

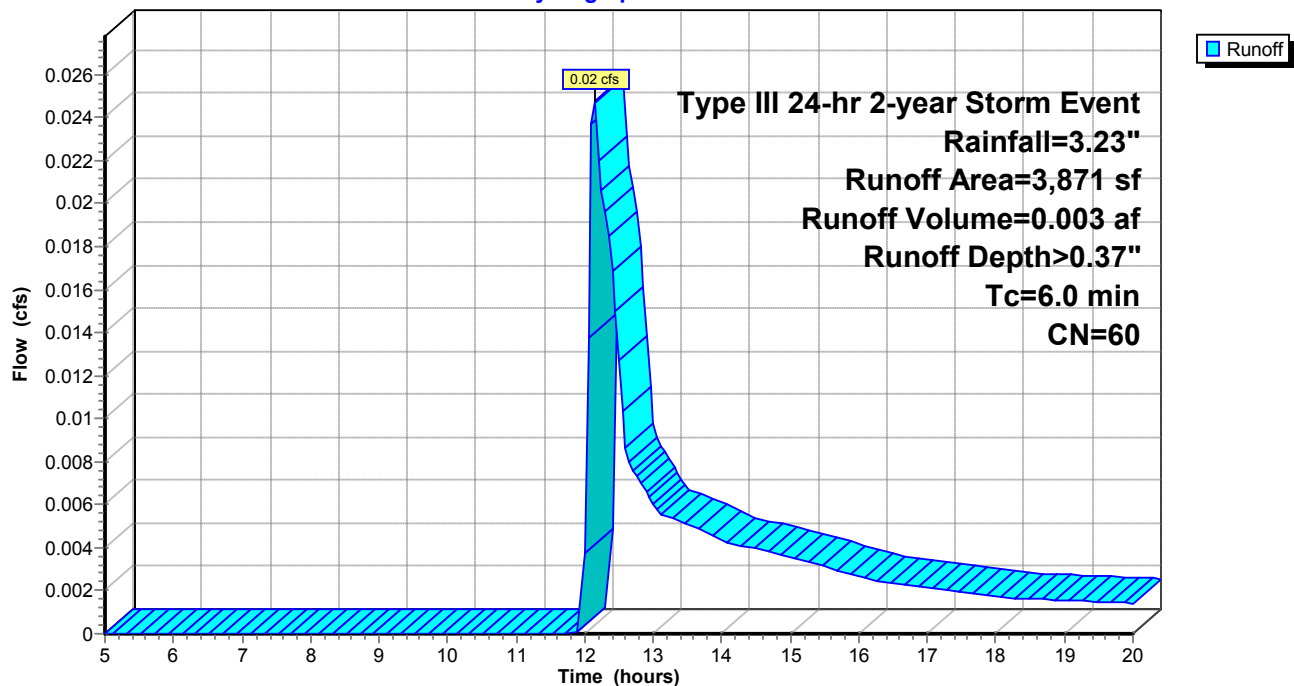
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
1,373	98	Paved parking & roofs
2,498	39	>75% Grass cover, Good, HSG A
3,871	60	Weighted Average
2,498		Pervious Area
1,373		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.33	0.00
5.25	0.20	0.00	0.00	18.25	3.01	0.34	0.00
5.50	0.21	0.00	0.00	18.50	3.02	0.34	0.00
5.75	0.22	0.00	0.00	18.75	3.03	0.35	0.00
6.00	0.23	0.00	0.00	19.00	3.05	0.35	0.00
6.25	0.25	0.00	0.00	19.25	3.06	0.35	0.00
6.50	0.26	0.00	0.00	19.50	3.07	0.36	0.00
6.75	0.28	0.00	0.00	19.75	3.08	0.36	0.00
7.00	0.29	0.00	0.00	20.00	3.09	0.37	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.00	0.00				
11.75	1.15	0.00	0.00				
12.00	1.61	0.01	0.00				
12.25	2.08	0.08	0.02				
12.50	2.27	0.11	0.01				
12.75	2.35	0.14	0.01				
13.00	2.42	0.15	0.01				
13.25	2.48	0.17	0.01				
13.50	2.53	0.18	0.01				
13.75	2.58	0.20	0.00				
14.00	2.62	0.21	0.00				
14.25	2.66	0.22	0.00				
14.50	2.69	0.23	0.00				
14.75	2.73	0.24	0.00				
15.00	2.76	0.25	0.00				
15.25	2.79	0.26	0.00				
15.50	2.82	0.27	0.00				
15.75	2.84	0.28	0.00				
16.00	2.86	0.29	0.00				
16.25	2.88	0.29	0.00				
16.50	2.90	0.30	0.00				
16.75	2.92	0.31	0.00				
17.00	2.94	0.31	0.00				
17.25	2.95	0.32	0.00				
17.50	2.97	0.32	0.00				
17.75	2.98	0.33	0.00				

[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

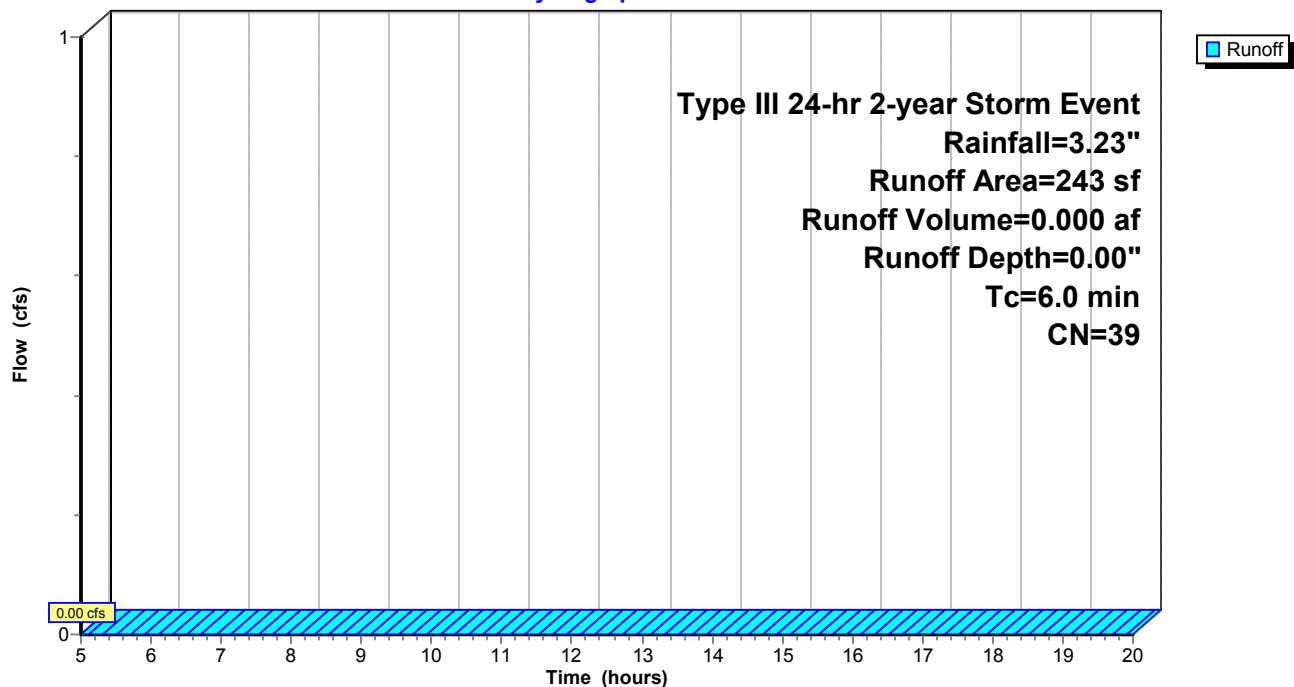
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
243	39	>75% Grass cover, Good, HSG A
243		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.00	0.00
5.25	0.20	0.00	0.00	18.25	3.01	0.00	0.00
5.50	0.21	0.00	0.00	18.50	3.02	0.00	0.00
5.75	0.22	0.00	0.00	18.75	3.03	0.00	0.00
6.00	0.23	0.00	0.00	19.00	3.05	0.00	0.00
6.25	0.25	0.00	0.00	19.25	3.06	0.00	0.00
6.50	0.26	0.00	0.00	19.50	3.07	0.00	0.00
6.75	0.28	0.00	0.00	19.75	3.08	0.00	0.00
7.00	0.29	0.00	0.00	20.00	3.09	0.00	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.00	0.00				
11.75	1.15	0.00	0.00				
12.00	1.61	0.00	0.00				
12.25	2.08	0.00	0.00				
12.50	2.27	0.00	0.00				
12.75	2.35	0.00	0.00				
13.00	2.42	0.00	0.00				
13.25	2.48	0.00	0.00				
13.50	2.53	0.00	0.00				
13.75	2.58	0.00	0.00				
14.00	2.62	0.00	0.00				
14.25	2.66	0.00	0.00				
14.50	2.69	0.00	0.00				
14.75	2.73	0.00	0.00				
15.00	2.76	0.00	0.00				
15.25	2.79	0.00	0.00				
15.50	2.82	0.00	0.00				
15.75	2.84	0.00	0.00				
16.00	2.86	0.00	0.00				
16.25	2.88	0.00	0.00				
16.50	2.90	0.00	0.00				
16.75	2.92	0.00	0.00				
17.00	2.94	0.00	0.00				
17.25	2.95	0.00	0.00				
17.50	2.97	0.00	0.00				
17.75	2.98	0.00	0.00				

[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Subcatchment 6S: Impervious Area

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

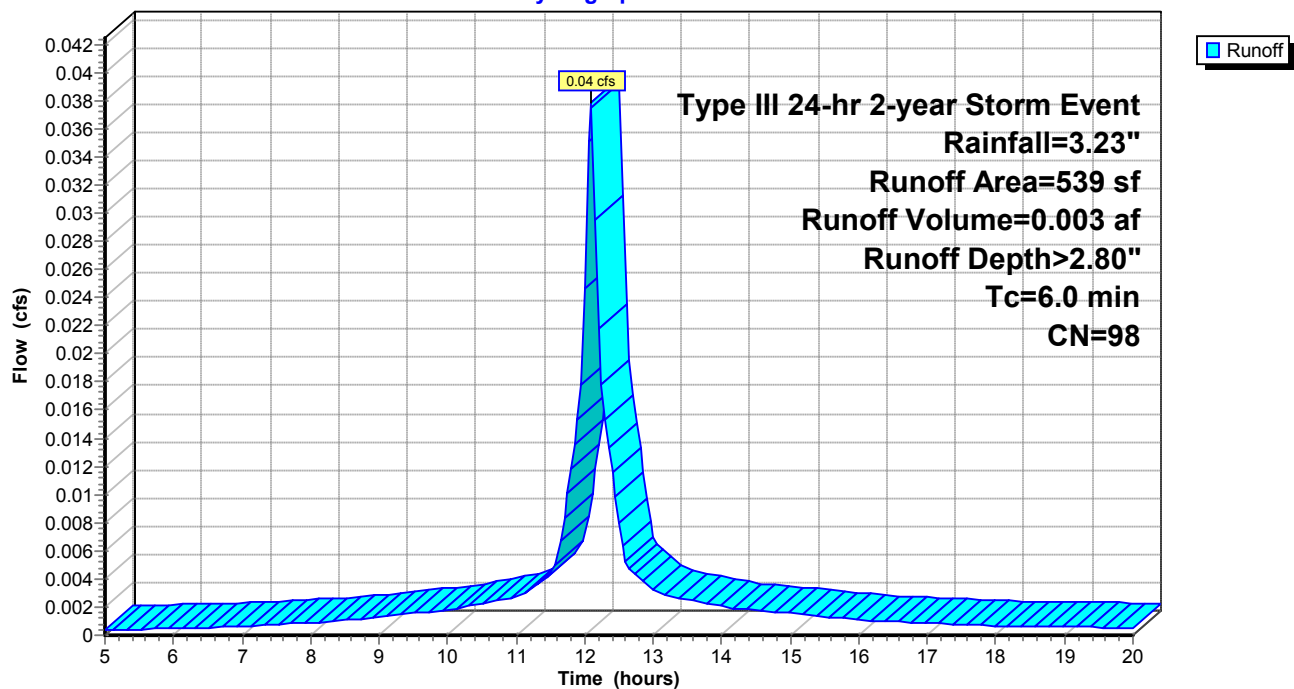
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
453	98	Driveway
86	98	Partial Roof
539	98	Weighted Average
539		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Impervious Area

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 6S: Impervious Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.06	0.00	18.00	3.00	2.77	0.00
5.25	0.20	0.07	0.00	18.25	3.01	2.78	0.00
5.50	0.21	0.07	0.00	18.50	3.02	2.79	0.00
5.75	0.22	0.08	0.00	18.75	3.03	2.80	0.00
6.00	0.23	0.09	0.00	19.00	3.05	2.81	0.00
6.25	0.25	0.10	0.00	19.25	3.06	2.83	0.00
6.50	0.26	0.11	0.00	19.50	3.07	2.84	0.00
6.75	0.28	0.13	0.00	19.75	3.08	2.85	0.00
7.00	0.29	0.14	0.00	20.00	3.09	2.86	0.00
7.25	0.31	0.15	0.00				
7.50	0.33	0.17	0.00				
7.75	0.35	0.18	0.00				
8.00	0.37	0.20	0.00				
8.25	0.39	0.22	0.00				
8.50	0.41	0.24	0.00				
8.75	0.44	0.27	0.00				
9.00	0.47	0.29	0.00				
9.25	0.50	0.32	0.00				
9.50	0.54	0.35	0.00				
9.75	0.57	0.38	0.00				
10.00	0.61	0.42	0.00				
10.25	0.65	0.46	0.00				
10.50	0.70	0.50	0.00				
10.75	0.75	0.55	0.00				
11.00	0.81	0.61	0.00				
11.25	0.88	0.67	0.00				
11.50	0.96	0.75	0.00				
11.75	1.15	0.93	0.01				
12.00	1.61	1.39	0.02				
12.25	2.08	1.86	0.02				
12.50	2.27	2.04	0.01				
12.75	2.35	2.13	0.00				
13.00	2.42	2.19	0.00				
13.25	2.48	2.25	0.00				
13.50	2.53	2.30	0.00				
13.75	2.58	2.35	0.00				
14.00	2.62	2.39	0.00				
14.25	2.66	2.43	0.00				
14.50	2.69	2.46	0.00				
14.75	2.73	2.50	0.00				
15.00	2.76	2.53	0.00				
15.25	2.79	2.56	0.00				
15.50	2.82	2.58	0.00				
15.75	2.84	2.61	0.00				
16.00	2.86	2.63	0.00				
16.25	2.88	2.65	0.00				
16.50	2.90	2.67	0.00				
16.75	2.92	2.69	0.00				
17.00	2.94	2.71	0.00				
17.25	2.95	2.72	0.00				
17.50	2.97	2.74	0.00				
17.75	2.98	2.75	0.00				

[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Subcatchment 7S: Walkway

Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.000 af, Depth> 2.80"

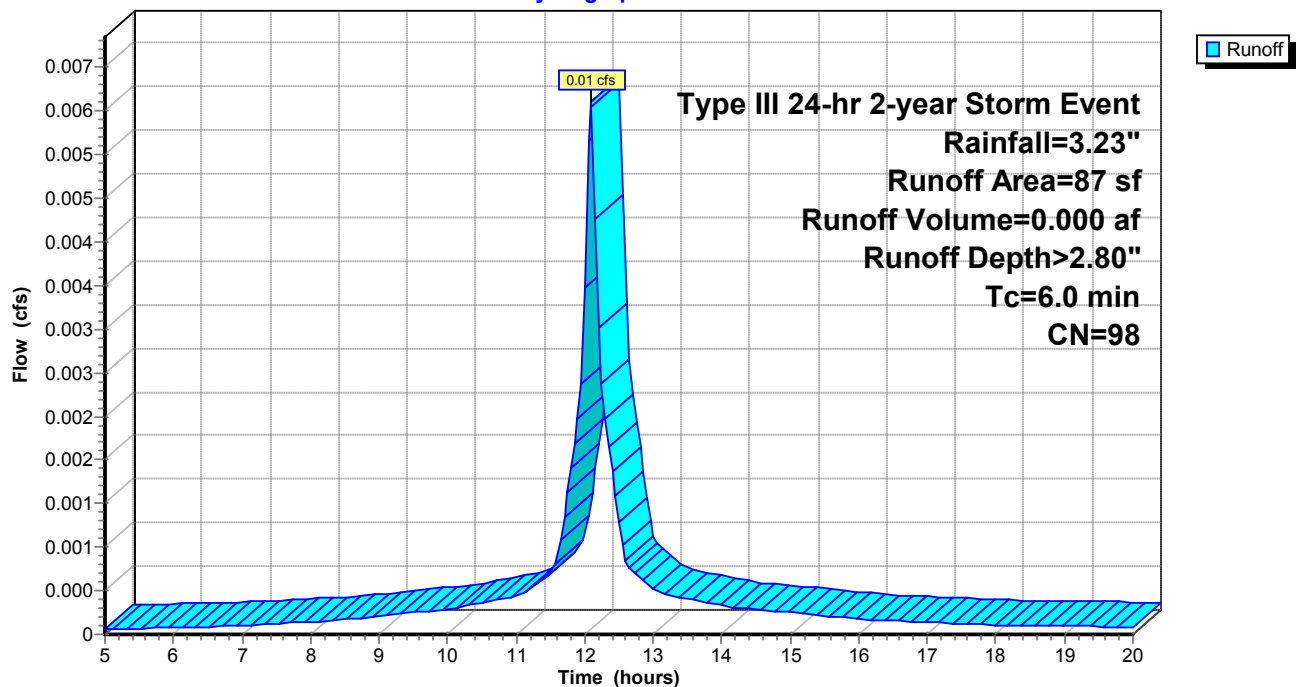
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
87	98	Paved parking & roofs
87		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.06	0.00	18.00	3.00	2.77	0.00
5.25	0.20	0.07	0.00	18.25	3.01	2.78	0.00
5.50	0.21	0.07	0.00	18.50	3.02	2.79	0.00
5.75	0.22	0.08	0.00	18.75	3.03	2.80	0.00
6.00	0.23	0.09	0.00	19.00	3.05	2.81	0.00
6.25	0.25	0.10	0.00	19.25	3.06	2.83	0.00
6.50	0.26	0.11	0.00	19.50	3.07	2.84	0.00
6.75	0.28	0.13	0.00	19.75	3.08	2.85	0.00
7.00	0.29	0.14	0.00	20.00	3.09	2.86	0.00
7.25	0.31	0.15	0.00				
7.50	0.33	0.17	0.00				
7.75	0.35	0.18	0.00				
8.00	0.37	0.20	0.00				
8.25	0.39	0.22	0.00				
8.50	0.41	0.24	0.00				
8.75	0.44	0.27	0.00				
9.00	0.47	0.29	0.00				
9.25	0.50	0.32	0.00				
9.50	0.54	0.35	0.00				
9.75	0.57	0.38	0.00				
10.00	0.61	0.42	0.00				
10.25	0.65	0.46	0.00				
10.50	0.70	0.50	0.00				
10.75	0.75	0.55	0.00				
11.00	0.81	0.61	0.00				
11.25	0.88	0.67	0.00				
11.50	0.96	0.75	0.00				
11.75	1.15	0.93	0.00				
12.00	1.61	1.39	0.00				
12.25	2.08	1.86	0.00				
12.50	2.27	2.04	0.00				
12.75	2.35	2.13	0.00				
13.00	2.42	2.19	0.00				
13.25	2.48	2.25	0.00				
13.50	2.53	2.30	0.00				
13.75	2.58	2.35	0.00				
14.00	2.62	2.39	0.00				
14.25	2.66	2.43	0.00				
14.50	2.69	2.46	0.00				
14.75	2.73	2.50	0.00				
15.00	2.76	2.53	0.00				
15.25	2.79	2.56	0.00				
15.50	2.82	2.58	0.00				
15.75	2.84	2.61	0.00				
16.00	2.86	2.63	0.00				
16.25	2.88	2.65	0.00				
16.50	2.90	2.67	0.00				
16.75	2.92	2.69	0.00				
17.00	2.94	2.71	0.00				
17.25	2.95	2.72	0.00				
17.50	2.97	2.74	0.00				
17.75	2.98	2.75	0.00				

[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

Prepared by Gala Simon Associates

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

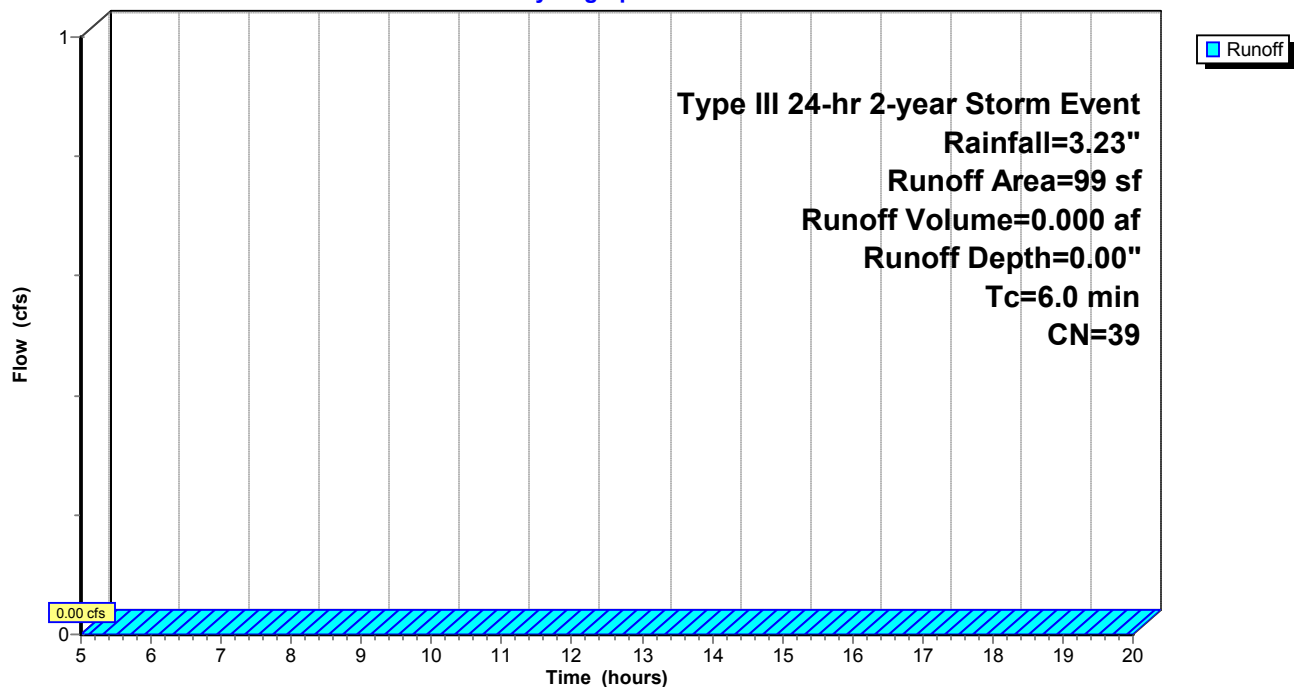
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Storm Event Rainfall=3.23"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.18	0.00	0.00	18.00	3.00	0.00	0.00
5.25	0.20	0.00	0.00	18.25	3.01	0.00	0.00
5.50	0.21	0.00	0.00	18.50	3.02	0.00	0.00
5.75	0.22	0.00	0.00	18.75	3.03	0.00	0.00
6.00	0.23	0.00	0.00	19.00	3.05	0.00	0.00
6.25	0.25	0.00	0.00	19.25	3.06	0.00	0.00
6.50	0.26	0.00	0.00	19.50	3.07	0.00	0.00
6.75	0.28	0.00	0.00	19.75	3.08	0.00	0.00
7.00	0.29	0.00	0.00	20.00	3.09	0.00	0.00
7.25	0.31	0.00	0.00				
7.50	0.33	0.00	0.00				
7.75	0.35	0.00	0.00				
8.00	0.37	0.00	0.00				
8.25	0.39	0.00	0.00				
8.50	0.41	0.00	0.00				
8.75	0.44	0.00	0.00				
9.00	0.47	0.00	0.00				
9.25	0.50	0.00	0.00				
9.50	0.54	0.00	0.00				
9.75	0.57	0.00	0.00				
10.00	0.61	0.00	0.00				
10.25	0.65	0.00	0.00				
10.50	0.70	0.00	0.00				
10.75	0.75	0.00	0.00				
11.00	0.81	0.00	0.00				
11.25	0.88	0.00	0.00				
11.50	0.96	0.00	0.00				
11.75	1.15	0.00	0.00				
12.00	1.61	0.00	0.00				
12.25	2.08	0.00	0.00				
12.50	2.27	0.00	0.00				
12.75	2.35	0.00	0.00				
13.00	2.42	0.00	0.00				
13.25	2.48	0.00	0.00				
13.50	2.53	0.00	0.00				
13.75	2.58	0.00	0.00				
14.00	2.62	0.00	0.00				
14.25	2.66	0.00	0.00				
14.50	2.69	0.00	0.00				
14.75	2.73	0.00	0.00				
15.00	2.76	0.00	0.00				
15.25	2.79	0.00	0.00				
15.50	2.82	0.00	0.00				
15.75	2.84	0.00	0.00				
16.00	2.86	0.00	0.00				
16.25	2.88	0.00	0.00				
16.50	2.90	0.00	0.00				
16.75	2.92	0.00	0.00				
17.00	2.94	0.00	0.00				
17.25	2.95	0.00	0.00				
17.50	2.97	0.00	0.00				
17.75	2.98	0.00	0.00				

[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 1.31" for 2-year Storm Event event
 Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.000 af
 Outflow = 0.01 cfs @ 12.05 hrs, Volume= 0.000 af, Atten= 18%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 12.05 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.64' @ 12.14 hrs Surf.Area= 0 sf Storage= 1 cf

Plug-Flow detention time= 1.3 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 1.0 min (739.5 - 738.5)

Volume	Invert	Avail.Storage	Storage Description
#1	3.62'	19 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.62	0
4.20	19

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.62 3.63 4.20 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 12.05 hrs HW=3.63' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions3

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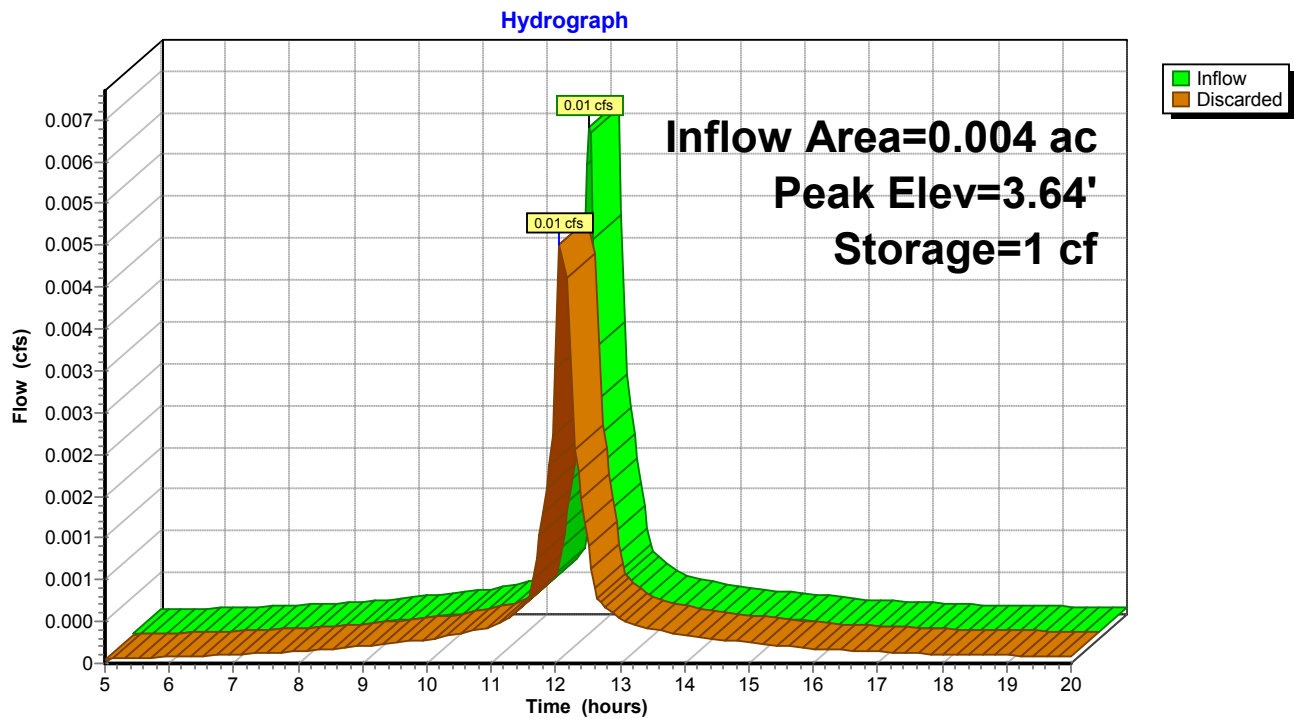
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Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions3*Type III 24-hr 2-year Storm Event Rainfall=3.23"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.62	0.00
5.50	0.00	0	3.62	0.00
6.00	0.00	0	3.62	0.00
6.50	0.00	0	3.62	0.00
7.00	0.00	0	3.62	0.00
7.50	0.00	0	3.62	0.00
8.00	0.00	0	3.62	0.00
8.50	0.00	0	3.62	0.00
9.00	0.00	0	3.62	0.00
9.50	0.00	0	3.62	0.00
10.00	0.00	0	3.62	0.00
10.50	0.00	0	3.62	0.00
11.00	0.00	0	3.62	0.00
11.50	0.00	0	3.62	0.00
12.00	0.00	0	3.63	0.00
12.50	0.00	0	3.62	0.00
13.00	0.00	0	3.62	0.00
13.50	0.00	0	3.62	0.00
14.00	0.00	0	3.62	0.00
14.50	0.00	0	3.62	0.00
15.00	0.00	0	3.62	0.00
15.50	0.00	0	3.62	0.00
16.00	0.00	0	3.62	0.00
16.50	0.00	0	3.62	0.00
17.00	0.00	0	3.62	0.00
17.50	0.00	0	3.62	0.00
18.00	0.00	0	3.62	0.00
18.50	0.00	0	3.62	0.00
19.00	0.00	0	3.62	0.00
19.50	0.00	0	3.62	0.00
20.00	0.00	0	3.62	0.00

[1120] Proposed Conditions3

Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.018 ac, Inflow Depth > 1.93" for 2-year Storm Event event
 Inflow = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af
 Outflow = 0.03 cfs @ 12.05 hrs, Volume= 0.003 af, Atten= 34%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 12.05 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.21' @ 12.18 hrs Surf.Area= 0 sf Storage= 6 cf

Plug-Flow detention time= 1.6 min calculated for 0.003 af (100% of inflow)
 Center-of-Mass det. time= 1.3 min (739.8 - 738.5)

Volume	Invert	Avail.Storage	Storage Description
#1	3.17'	87 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.17	0
3.75	87

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.17 3.18 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 12.05 hrs HW=3.19' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions3

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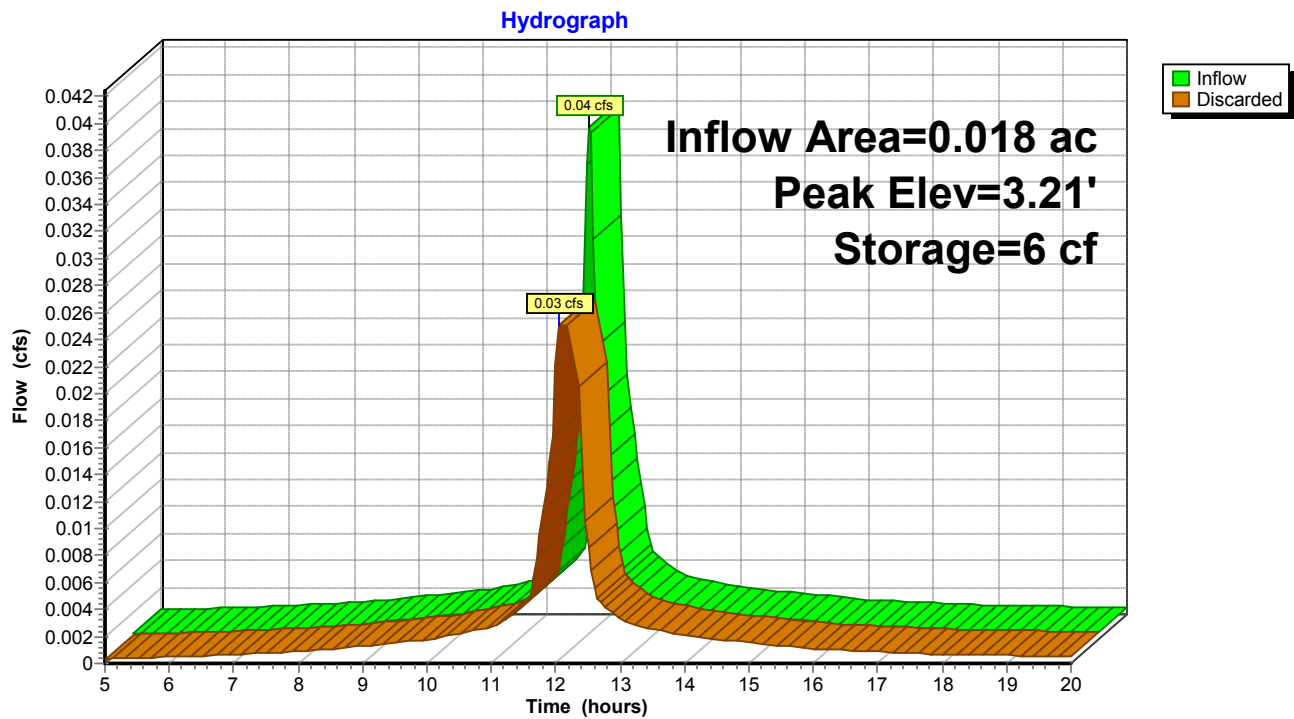
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Type III 24-hr 2-year Storm Event Rainfall=3.23"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions3*Type III 24-hr 2-year Storm Event Rainfall=3.23"*

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.17	0.00
5.50	0.00	0	3.17	0.00
6.00	0.00	0	3.17	0.00
6.50	0.00	0	3.17	0.00
7.00	0.00	0	3.17	0.00
7.50	0.00	0	3.17	0.00
8.00	0.00	0	3.17	0.00
8.50	0.00	0	3.17	0.00
9.00	0.00	0	3.17	0.00
9.50	0.00	0	3.17	0.00
10.00	0.00	0	3.17	0.00
10.50	0.00	0	3.17	0.00
11.00	0.00	0	3.17	0.00
11.50	0.00	0	3.17	0.00
12.00	0.02	1	3.18	0.02
12.50	0.01	1	3.17	0.01
13.00	0.00	0	3.17	0.00
13.50	0.00	0	3.17	0.00
14.00	0.00	0	3.17	0.00
14.50	0.00	0	3.17	0.00
15.00	0.00	0	3.17	0.00
15.50	0.00	0	3.17	0.00
16.00	0.00	0	3.17	0.00
16.50	0.00	0	3.17	0.00
17.00	0.00	0	3.17	0.00
17.50	0.00	0	3.17	0.00
18.00	0.00	0	3.17	0.00
18.50	0.00	0	3.17	0.00
19.00	0.00	0	3.17	0.00
19.50	0.00	0	3.17	0.00
20.00	0.00	0	3.17	0.00

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 1S: Remainder of Land

Runoff = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

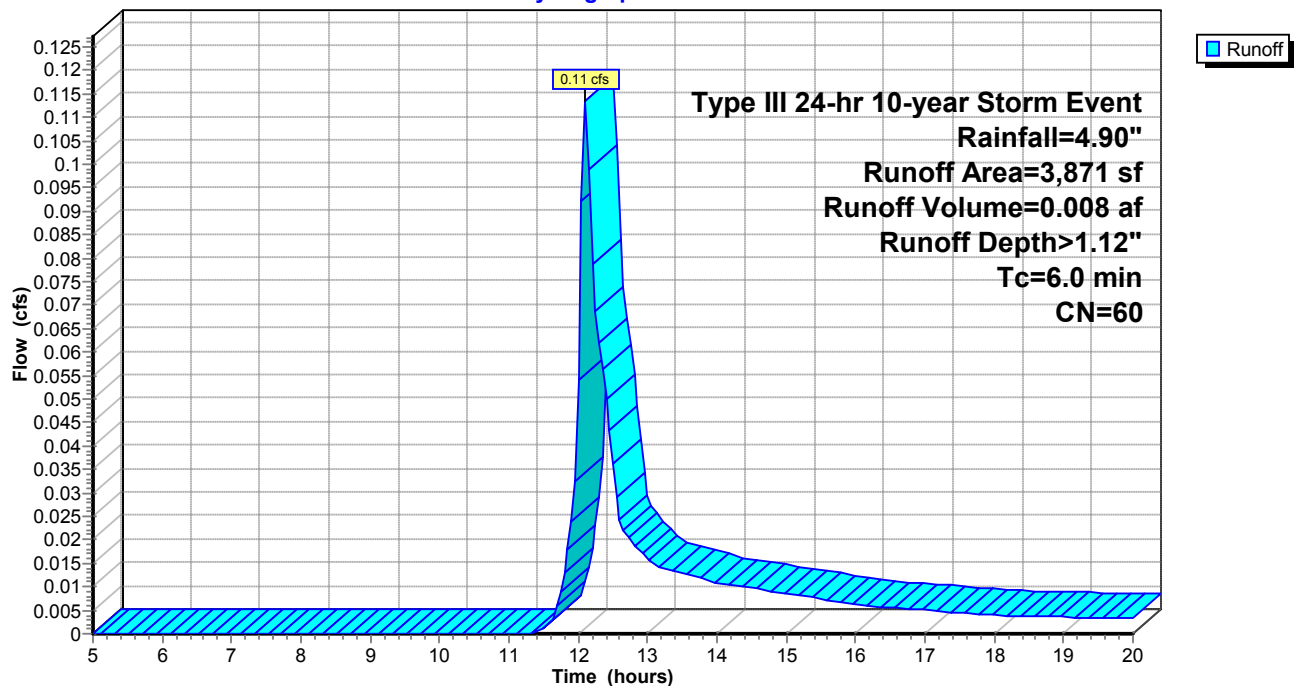
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
1,373	98	Paved parking & roofs
2,498	39	>75% Grass cover, Good, HSG A
3,871	60	Weighted Average
2,498		Pervious Area
1,373		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	1.05	0.00
5.25	0.30	0.00	0.00	18.25	4.57	1.06	0.00
5.50	0.31	0.00	0.00	18.50	4.59	1.07	0.00
5.75	0.33	0.00	0.00	18.75	4.60	1.08	0.00
6.00	0.35	0.00	0.00	19.00	4.62	1.09	0.00
6.25	0.37	0.00	0.00	19.25	4.64	1.10	0.00
6.50	0.40	0.00	0.00	19.50	4.66	1.11	0.00
6.75	0.42	0.00	0.00	19.75	4.67	1.11	0.00
7.00	0.44	0.00	0.00	20.00	4.69	1.12	0.00
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.00	0.00				
10.25	0.99	0.00	0.00				
10.50	1.06	0.00	0.00				
10.75	1.14	0.00	0.00				
11.00	1.22	0.00	0.00				
11.25	1.33	0.00	0.00				
11.50	1.46	0.00	0.00				
11.75	1.74	0.02	0.01				
12.00	2.45	0.16	0.05				
12.25	3.16	0.39	0.07				
12.50	3.44	0.51	0.04				
12.75	3.57	0.56	0.02				
13.00	3.67	0.61	0.02				
13.25	3.76	0.65	0.01				
13.50	3.84	0.68	0.01				
13.75	3.91	0.72	0.01				
14.00	3.97	0.75	0.01				
14.25	4.03	0.78	0.01				
14.50	4.09	0.80	0.01				
14.75	4.14	0.83	0.01				
15.00	4.19	0.85	0.01				
15.25	4.23	0.88	0.01				
15.50	4.27	0.90	0.01				
15.75	4.31	0.92	0.01				
16.00	4.34	0.94	0.01				
16.25	4.37	0.95	0.01				
16.50	4.40	0.97	0.01				
16.75	4.43	0.98	0.01				
17.00	4.46	1.00	0.01				
17.25	4.48	1.01	0.00				
17.50	4.50	1.02	0.00				
17.75	4.53	1.03	0.00				

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 12.50 hrs, Volume= 0.000 af, Depth> 0.14"

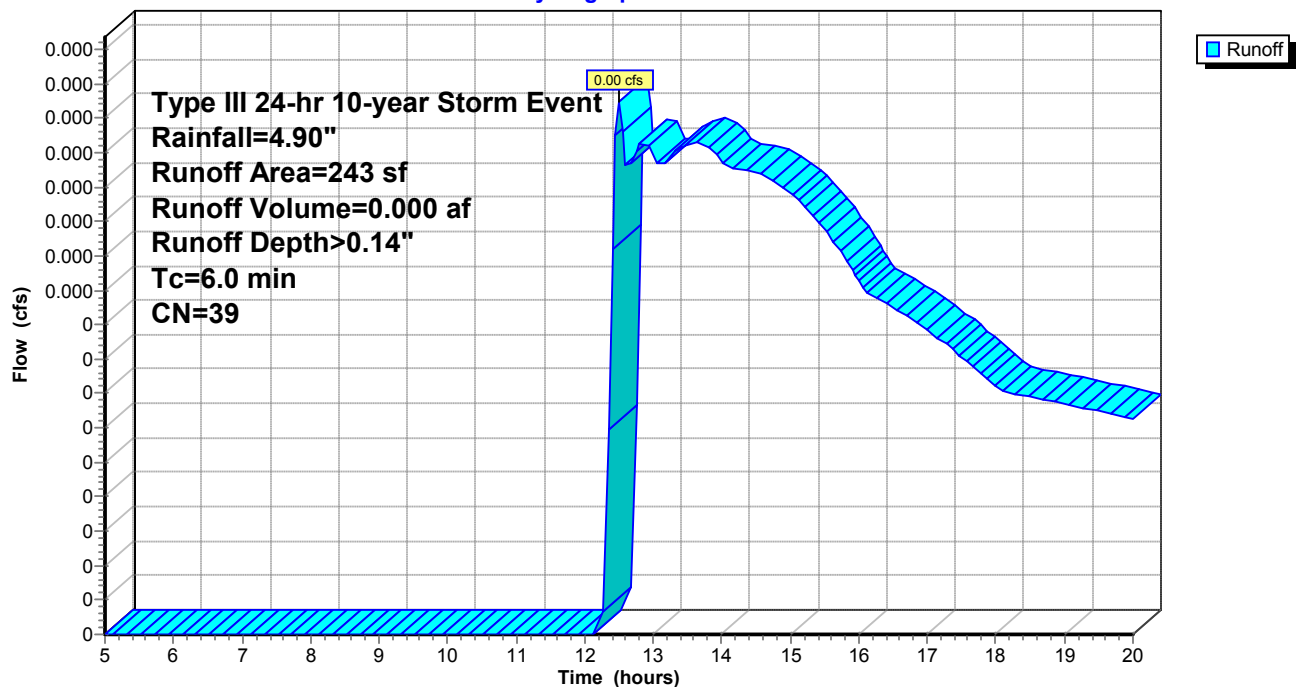
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
243	39	>75% Grass cover, Good, HSG A
243		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	0.12	0.00
5.25	0.30	0.00	0.00	18.25	4.57	0.12	0.00
5.50	0.31	0.00	0.00	18.50	4.59	0.12	0.00
5.75	0.33	0.00	0.00	18.75	4.60	0.13	0.00
6.00	0.35	0.00	0.00	19.00	4.62	0.13	0.00
6.25	0.37	0.00	0.00	19.25	4.64	0.13	0.00
6.50	0.40	0.00	0.00	19.50	4.66	0.14	0.00
6.75	0.42	0.00	0.00	19.75	4.67	0.14	0.00
7.00	0.44	0.00	0.00	20.00	4.69	0.14	0.00
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.00	0.00				
10.25	0.99	0.00	0.00				
10.50	1.06	0.00	0.00				
10.75	1.14	0.00	0.00				
11.00	1.22	0.00	0.00				
11.25	1.33	0.00	0.00				
11.50	1.46	0.00	0.00				
11.75	1.74	0.00	0.00				
12.00	2.45	0.00	0.00				
12.25	3.16	0.00	0.00				
12.50	3.44	0.01	0.00				
12.75	3.57	0.01	0.00				
13.00	3.67	0.02	0.00				
13.25	3.76	0.02	0.00				
13.50	3.84	0.03	0.00				
13.75	3.91	0.04	0.00				
14.00	3.97	0.04	0.00				
14.25	4.03	0.05	0.00				
14.50	4.09	0.06	0.00				
14.75	4.14	0.06	0.00				
15.00	4.19	0.07	0.00				
15.25	4.23	0.07	0.00				
15.50	4.27	0.08	0.00				
15.75	4.31	0.08	0.00				
16.00	4.34	0.09	0.00				
16.25	4.37	0.09	0.00				
16.50	4.40	0.10	0.00				
16.75	4.43	0.10	0.00				
17.00	4.46	0.10	0.00				
17.25	4.48	0.11	0.00				
17.50	4.50	0.11	0.00				
17.75	4.53	0.11	0.00				

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 6S: Impervious Area

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

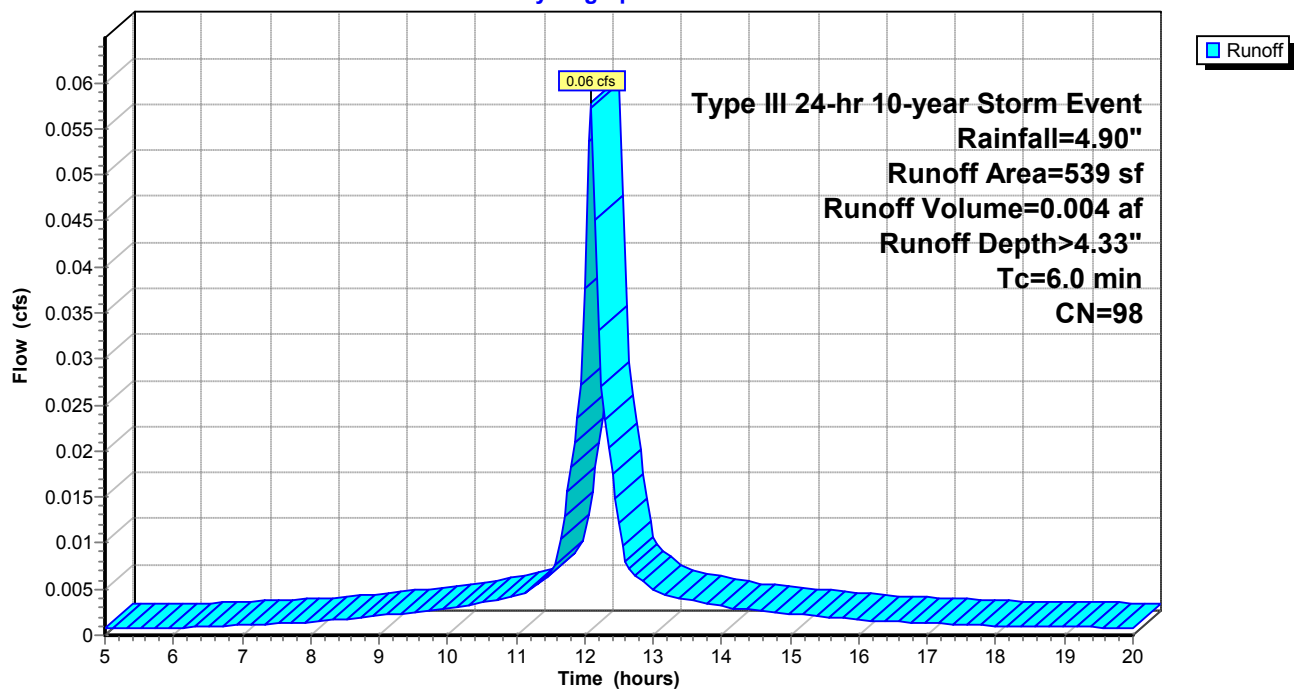
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
453	98	Driveway
86	98	Partial Roof
539	98	Weighted Average
539		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Impervious Area

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 6S: Impervious Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.13	0.00	18.00	4.55	4.31	0.00
5.25	0.30	0.14	0.00	18.25	4.57	4.33	0.00
5.50	0.31	0.16	0.00	18.50	4.59	4.35	0.00
5.75	0.33	0.17	0.00	18.75	4.60	4.37	0.00
6.00	0.35	0.19	0.00	19.00	4.62	4.39	0.00
6.25	0.37	0.21	0.00	19.25	4.64	4.40	0.00
6.50	0.40	0.22	0.00	19.50	4.66	4.42	0.00
6.75	0.42	0.25	0.00	19.75	4.67	4.44	0.00
7.00	0.44	0.27	0.00	20.00	4.69	4.45	0.00
7.25	0.47	0.29	0.00				
7.50	0.50	0.32	0.00				
7.75	0.53	0.34	0.00				
8.00	0.56	0.37	0.00				
8.25	0.59	0.40	0.00				
8.50	0.63	0.44	0.00				
8.75	0.67	0.48	0.00				
9.00	0.71	0.52	0.00				
9.25	0.76	0.56	0.00				
9.50	0.81	0.61	0.00				
9.75	0.87	0.66	0.00				
10.00	0.93	0.72	0.00				
10.25	0.99	0.78	0.00				
10.50	1.06	0.85	0.00				
10.75	1.14	0.93	0.00				
11.00	1.22	1.01	0.00				
11.25	1.33	1.11	0.01				
11.50	1.46	1.24	0.01				
11.75	1.74	1.52	0.02				
12.00	2.45	2.22	0.04				
12.25	3.16	2.93	0.03				
12.50	3.44	3.21	0.01				
12.75	3.57	3.34	0.01				
13.00	3.67	3.44	0.00				
13.25	3.76	3.53	0.00				
13.50	3.84	3.60	0.00				
13.75	3.91	3.68	0.00				
14.00	3.97	3.74	0.00				
14.25	4.03	3.80	0.00				
14.50	4.09	3.85	0.00				
14.75	4.14	3.90	0.00				
15.00	4.19	3.95	0.00				
15.25	4.23	3.99	0.00				
15.50	4.27	4.04	0.00				
15.75	4.31	4.07	0.00				
16.00	4.34	4.11	0.00				
16.25	4.37	4.14	0.00				
16.50	4.40	4.17	0.00				
16.75	4.43	4.19	0.00				
17.00	4.46	4.22	0.00				
17.25	4.48	4.25	0.00				
17.50	4.50	4.27	0.00				
17.75	4.53	4.29	0.00				

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 7S: Walkway

Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

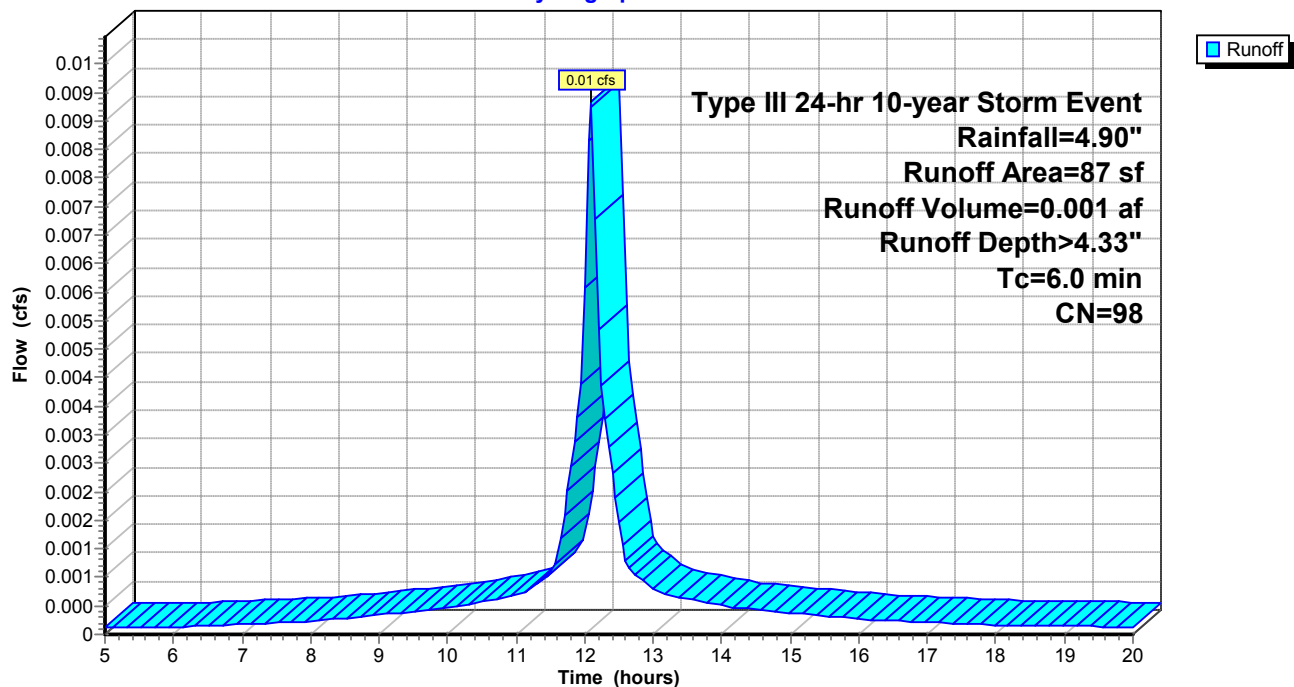
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
87	98	Paved parking & roofs
87		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.13	0.00	18.00	4.55	4.31	0.00
5.25	0.30	0.14	0.00	18.25	4.57	4.33	0.00
5.50	0.31	0.16	0.00	18.50	4.59	4.35	0.00
5.75	0.33	0.17	0.00	18.75	4.60	4.37	0.00
6.00	0.35	0.19	0.00	19.00	4.62	4.39	0.00
6.25	0.37	0.21	0.00	19.25	4.64	4.40	0.00
6.50	0.40	0.22	0.00	19.50	4.66	4.42	0.00
6.75	0.42	0.25	0.00	19.75	4.67	4.44	0.00
7.00	0.44	0.27	0.00	20.00	4.69	4.45	0.00
7.25	0.47	0.29	0.00				
7.50	0.50	0.32	0.00				
7.75	0.53	0.34	0.00				
8.00	0.56	0.37	0.00				
8.25	0.59	0.40	0.00				
8.50	0.63	0.44	0.00				
8.75	0.67	0.48	0.00				
9.00	0.71	0.52	0.00				
9.25	0.76	0.56	0.00				
9.50	0.81	0.61	0.00				
9.75	0.87	0.66	0.00				
10.00	0.93	0.72	0.00				
10.25	0.99	0.78	0.00				
10.50	1.06	0.85	0.00				
10.75	1.14	0.93	0.00				
11.00	1.22	1.01	0.00				
11.25	1.33	1.11	0.00				
11.50	1.46	1.24	0.00				
11.75	1.74	1.52	0.00				
12.00	2.45	2.22	0.01				
12.25	3.16	2.93	0.00				
12.50	3.44	3.21	0.00				
12.75	3.57	3.34	0.00				
13.00	3.67	3.44	0.00				
13.25	3.76	3.53	0.00				
13.50	3.84	3.60	0.00				
13.75	3.91	3.68	0.00				
14.00	3.97	3.74	0.00				
14.25	4.03	3.80	0.00				
14.50	4.09	3.85	0.00				
14.75	4.14	3.90	0.00				
15.00	4.19	3.95	0.00				
15.25	4.23	3.99	0.00				
15.50	4.27	4.04	0.00				
15.75	4.31	4.07	0.00				
16.00	4.34	4.11	0.00				
16.25	4.37	4.14	0.00				
16.50	4.40	4.17	0.00				
16.75	4.43	4.19	0.00				
17.00	4.46	4.22	0.00				
17.25	4.48	4.25	0.00				
17.50	4.50	4.27	0.00				
17.75	4.53	4.29	0.00				

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 12.50 hrs, Volume= 0.000 af, Depth> 0.14"

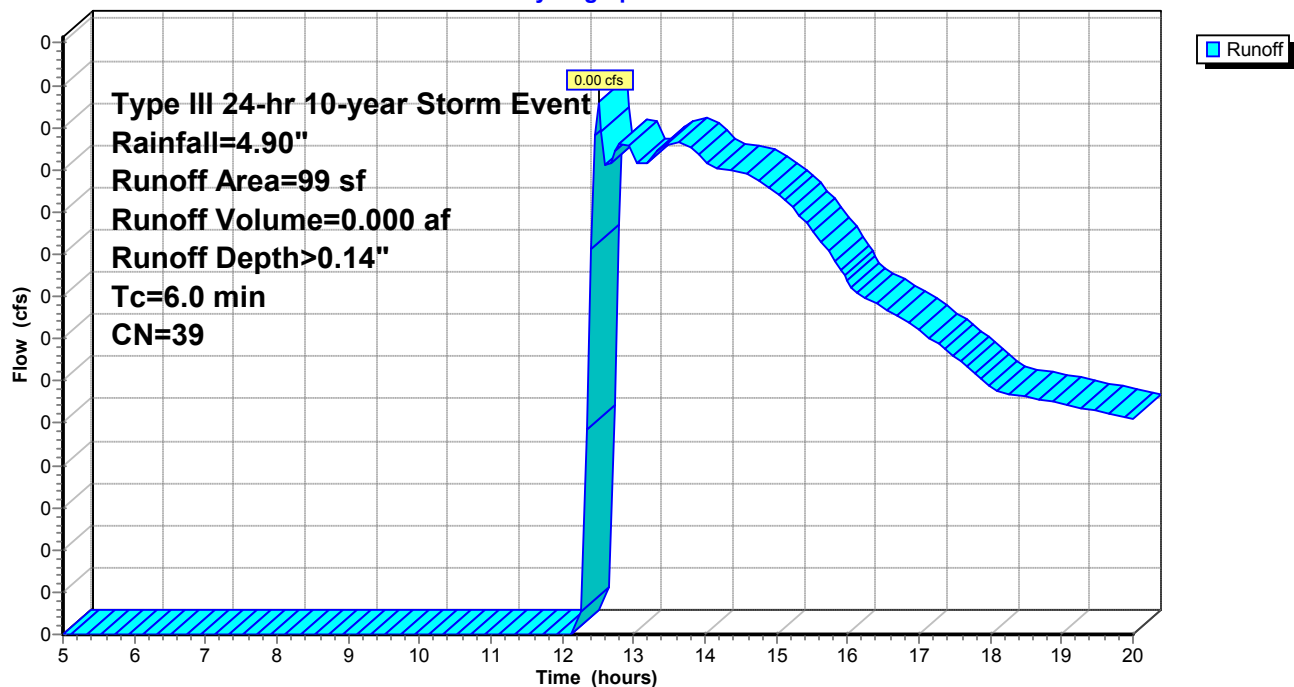
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Storm Event Rainfall=4.90"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions3*Type III 24-hr 10-year Storm Event Rainfall=4.90"*

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.28	0.00	0.00	18.00	4.55	0.12	0.00
5.25	0.30	0.00	0.00	18.25	4.57	0.12	0.00
5.50	0.31	0.00	0.00	18.50	4.59	0.12	0.00
5.75	0.33	0.00	0.00	18.75	4.60	0.13	0.00
6.00	0.35	0.00	0.00	19.00	4.62	0.13	0.00
6.25	0.37	0.00	0.00	19.25	4.64	0.13	0.00
6.50	0.40	0.00	0.00	19.50	4.66	0.14	0.00
6.75	0.42	0.00	0.00	19.75	4.67	0.14	0.00
7.00	0.44	0.00	0.00	20.00	4.69	0.14	0.00
7.25	0.47	0.00	0.00				
7.50	0.50	0.00	0.00				
7.75	0.53	0.00	0.00				
8.00	0.56	0.00	0.00				
8.25	0.59	0.00	0.00				
8.50	0.63	0.00	0.00				
8.75	0.67	0.00	0.00				
9.00	0.71	0.00	0.00				
9.25	0.76	0.00	0.00				
9.50	0.81	0.00	0.00				
9.75	0.87	0.00	0.00				
10.00	0.93	0.00	0.00				
10.25	0.99	0.00	0.00				
10.50	1.06	0.00	0.00				
10.75	1.14	0.00	0.00				
11.00	1.22	0.00	0.00				
11.25	1.33	0.00	0.00				
11.50	1.46	0.00	0.00				
11.75	1.74	0.00	0.00				
12.00	2.45	0.00	0.00				
12.25	3.16	0.00	0.00				
12.50	3.44	0.01	0.00				
12.75	3.57	0.01	0.00				
13.00	3.67	0.02	0.00				
13.25	3.76	0.02	0.00				
13.50	3.84	0.03	0.00				
13.75	3.91	0.04	0.00				
14.00	3.97	0.04	0.00				
14.25	4.03	0.05	0.00				
14.50	4.09	0.06	0.00				
14.75	4.14	0.06	0.00				
15.00	4.19	0.07	0.00				
15.25	4.23	0.07	0.00				
15.50	4.27	0.08	0.00				
15.75	4.31	0.08	0.00				
16.00	4.34	0.09	0.00				
16.25	4.37	0.09	0.00				
16.50	4.40	0.10	0.00				
16.75	4.43	0.10	0.00				
17.00	4.46	0.10	0.00				
17.25	4.48	0.11	0.00				
17.50	4.50	0.11	0.00				
17.75	4.53	0.11	0.00				

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 2.10" for 10-year Storm Event event
 Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 12.00 hrs, Volume= 0.001 af, Atten= 47%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 12.00 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.69' @ 12.22 hrs Surf.Area= 0 sf Storage= 2 cf

Plug-Flow detention time= 2.4 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 2.2 min (744.5 - 742.3)

Volume	Invert	Avail.Storage	Storage Description
#1	3.62'	19 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.62	0
4.20	19

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.62 3.63 4.20 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 12.00 hrs HW=3.63' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions3

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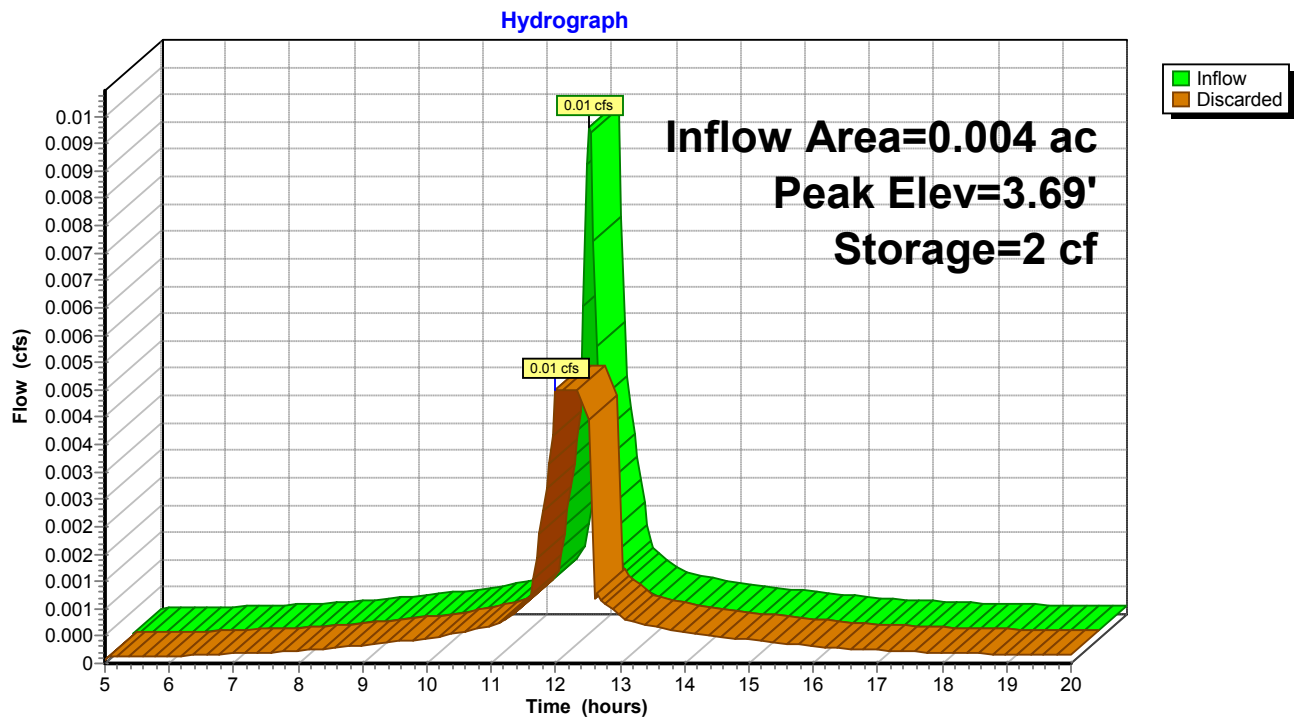
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Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions3*Type III 24-hr 10-year Storm Event Rainfall=4.90"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.62	0.00
5.50	0.00	0	3.62	0.00
6.00	0.00	0	3.62	0.00
6.50	0.00	0	3.62	0.00
7.00	0.00	0	3.62	0.00
7.50	0.00	0	3.62	0.00
8.00	0.00	0	3.62	0.00
8.50	0.00	0	3.62	0.00
9.00	0.00	0	3.62	0.00
9.50	0.00	0	3.62	0.00
10.00	0.00	0	3.62	0.00
10.50	0.00	0	3.62	0.00
11.00	0.00	0	3.62	0.00
11.50	0.00	0	3.62	0.00
12.00	0.01	0	3.63	0.01
12.50	0.00	1	3.64	0.01
13.00	0.00	0	3.62	0.00
13.50	0.00	0	3.62	0.00
14.00	0.00	0	3.62	0.00
14.50	0.00	0	3.62	0.00
15.00	0.00	0	3.62	0.00
15.50	0.00	0	3.62	0.00
16.00	0.00	0	3.62	0.00
16.50	0.00	0	3.62	0.00
17.00	0.00	0	3.62	0.00
17.50	0.00	0	3.62	0.00
18.00	0.00	0	3.62	0.00
18.50	0.00	0	3.62	0.00
19.00	0.00	0	3.62	0.00
19.50	0.00	0	3.62	0.00
20.00	0.00	0	3.62	0.00

[1120] Proposed Conditions3

Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.018 ac, Inflow Depth > 3.03" for 10-year Storm Event event
 Inflow = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af
 Outflow = 0.03 cfs @ 11.95 hrs, Volume= 0.005 af, Atten= 57%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.95 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.31' @ 12.28 hrs Surf.Area= 0 sf Storage= 20 cf

Plug-Flow detention time= 3.9 min calculated for 0.005 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (741.7 - 738.1)

Volume	Invert	Avail.Storage	Storage Description
#1	3.17'	87 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.17	0
3.75	87

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.17 3.18 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 11.95 hrs HW=3.18' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions3

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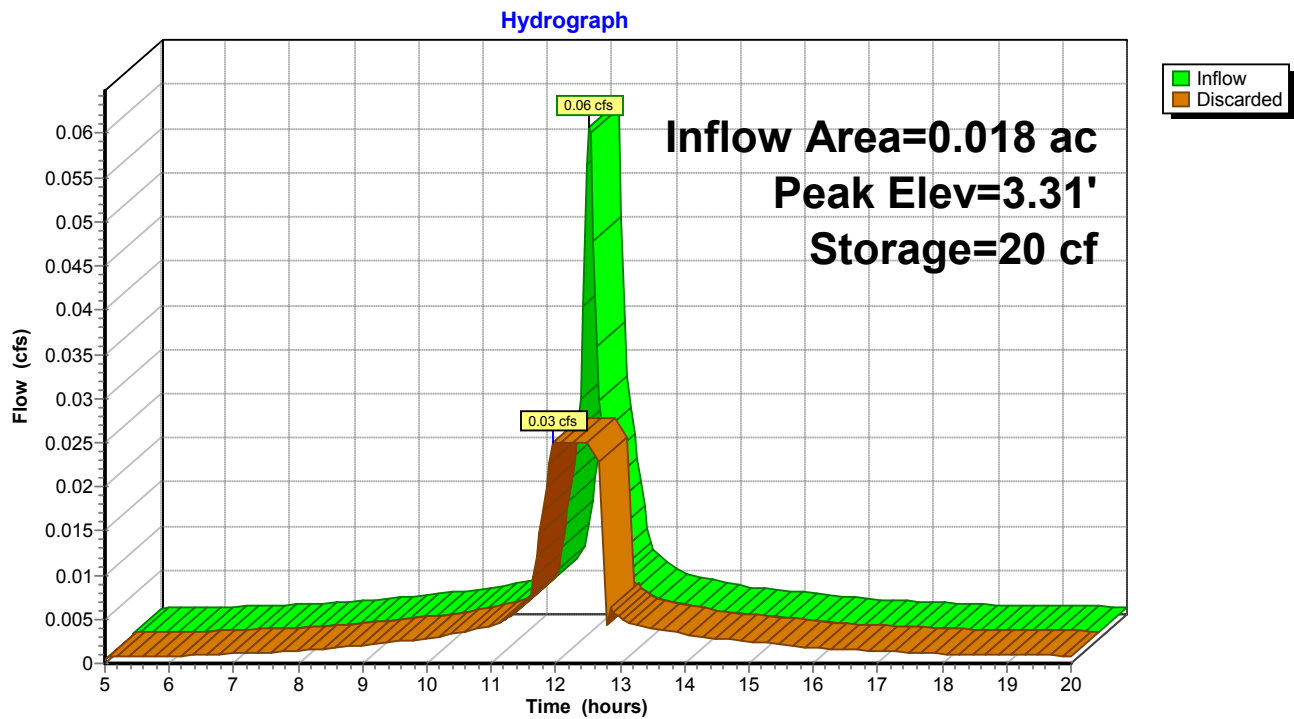
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Type III 24-hr 10-year Storm Event Rainfall=4.90"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions3*Type III 24-hr 10-year Storm Event Rainfall=4.90"*

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.17	0.00
5.50	0.00	0	3.17	0.00
6.00	0.00	0	3.17	0.00
6.50	0.00	0	3.17	0.00
7.00	0.00	0	3.17	0.00
7.50	0.00	0	3.17	0.00
8.00	0.00	0	3.17	0.00
8.50	0.00	0	3.17	0.00
9.00	0.00	0	3.17	0.00
9.50	0.00	0	3.17	0.00
10.00	0.00	0	3.17	0.00
10.50	0.00	0	3.17	0.00
11.00	0.00	0	3.17	0.00
11.50	0.01	0	3.17	0.01
12.00	0.04	3	3.19	0.03
12.50	0.01	15	3.27	0.03
13.00	0.01	0	3.17	0.01
13.50	0.00	0	3.17	0.00
14.00	0.00	0	3.17	0.00
14.50	0.00	0	3.17	0.00
15.00	0.00	0	3.17	0.00
15.50	0.00	0	3.17	0.00
16.00	0.00	0	3.17	0.00
16.50	0.00	0	3.17	0.00
17.00	0.00	0	3.17	0.00
17.50	0.00	0	3.17	0.00
18.00	0.00	0	3.17	0.00
18.50	0.00	0	3.17	0.00
19.00	0.00	0	3.17	0.00
19.50	0.00	0	3.17	0.00
20.00	0.00	0	3.17	0.00

[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 1S: Remainder of Land

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.014 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

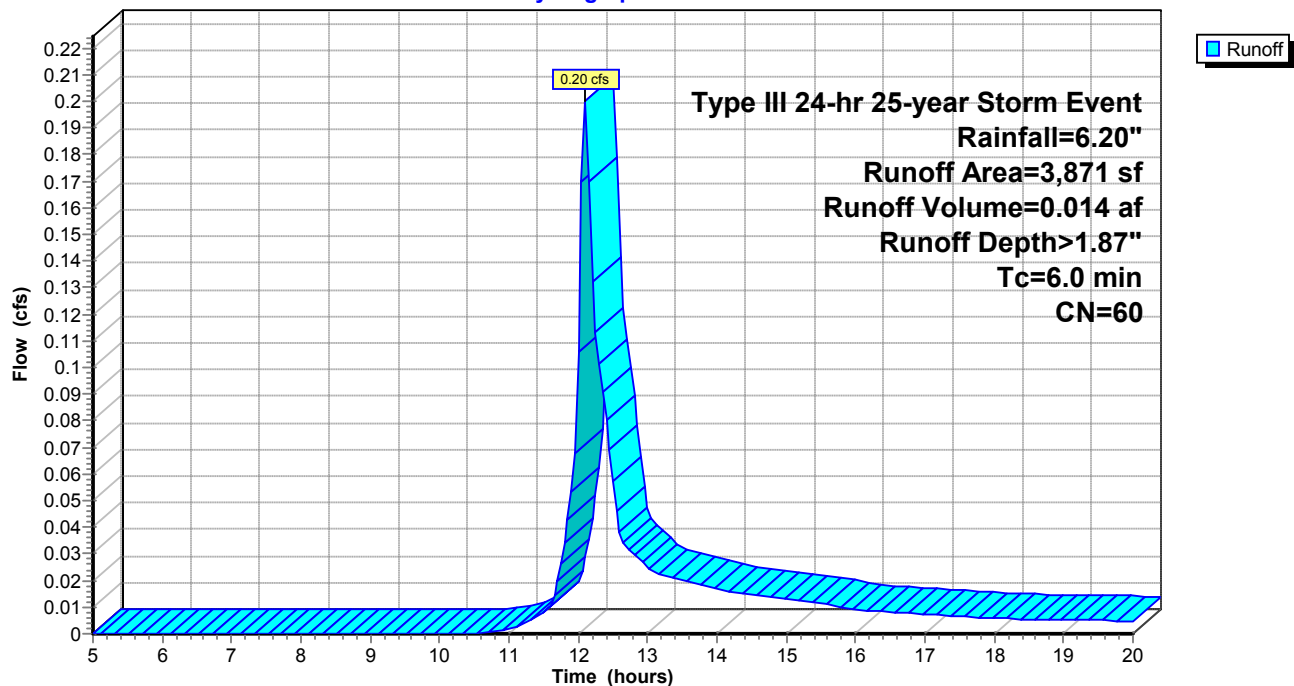
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
1,373	98	Paved parking & roofs
2,498	39	>75% Grass cover, Good, HSG A
3,871	60	Weighted Average
2,498		Pervious Area
1,373		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	1.76	0.01
5.25	0.37	0.00	0.00	18.25	5.78	1.78	0.01
5.50	0.40	0.00	0.00	18.50	5.80	1.79	0.01
5.75	0.42	0.00	0.00	18.75	5.83	1.81	0.01
6.00	0.45	0.00	0.00	19.00	5.85	1.82	0.01
6.25	0.47	0.00	0.00	19.25	5.87	1.84	0.01
6.50	0.50	0.00	0.00	19.50	5.89	1.85	0.00
6.75	0.53	0.00	0.00	19.75	5.91	1.86	0.00
7.00	0.56	0.00	0.00	20.00	5.93	1.88	0.00
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.00	0.00				
9.50	1.03	0.00	0.00				
9.75	1.10	0.00	0.00				
10.00	1.17	0.00	0.00				
10.25	1.25	0.00	0.00				
10.50	1.34	0.00	0.00				
10.75	1.44	0.00	0.00				
11.00	1.55	0.01	0.00				
11.25	1.68	0.02	0.00				
11.50	1.85	0.04	0.01				
11.75	2.20	0.10	0.03				
12.00	3.10	0.37	0.11				
12.25	4.00	0.76	0.11				
12.50	4.35	0.94	0.06				
12.75	4.52	1.03	0.03				
13.00	4.65	1.10	0.02				
13.25	4.76	1.16	0.02				
13.50	4.86	1.22	0.02				
13.75	4.95	1.27	0.02				
14.00	5.03	1.32	0.02				
14.25	5.10	1.36	0.02				
14.50	5.17	1.40	0.01				
14.75	5.24	1.44	0.01				
15.00	5.30	1.48	0.01				
15.25	5.35	1.51	0.01				
15.50	5.40	1.54	0.01				
15.75	5.45	1.57	0.01				
16.00	5.49	1.60	0.01				
16.25	5.53	1.62	0.01				
16.50	5.57	1.65	0.01				
16.75	5.61	1.67	0.01				
17.00	5.64	1.69	0.01				
17.25	5.67	1.71	0.01				
17.50	5.70	1.73	0.01				
17.75	5.73	1.75	0.01				

[1120] Proposed Conditions3

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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 2S: Lawn

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

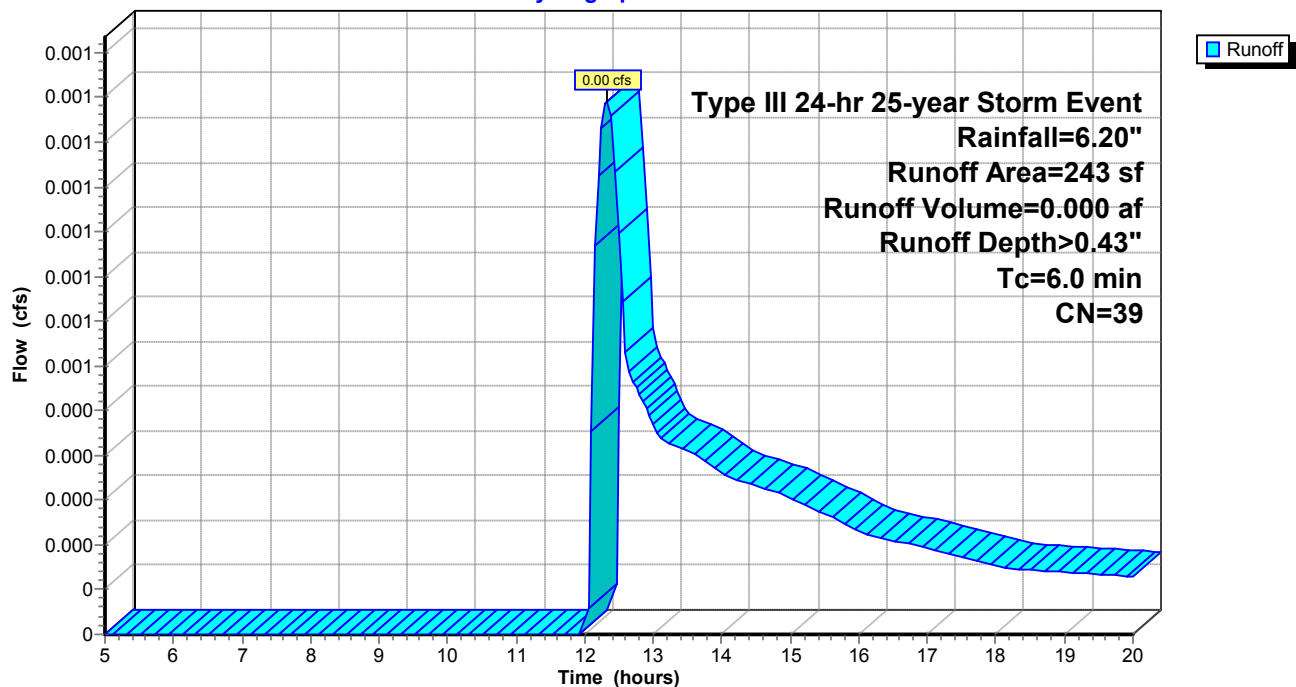
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
243	39	>75% Grass cover, Good, HSG A
243		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	0.38	0.00
5.25	0.37	0.00	0.00	18.25	5.78	0.38	0.00
5.50	0.40	0.00	0.00	18.50	5.80	0.39	0.00
5.75	0.42	0.00	0.00	18.75	5.83	0.40	0.00
6.00	0.45	0.00	0.00	19.00	5.85	0.40	0.00
6.25	0.47	0.00	0.00	19.25	5.87	0.41	0.00
6.50	0.50	0.00	0.00	19.50	5.89	0.42	0.00
6.75	0.53	0.00	0.00	19.75	5.91	0.42	0.00
7.00	0.56	0.00	0.00	20.00	5.93	0.43	0.00
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.00	0.00				
9.50	1.03	0.00	0.00				
9.75	1.10	0.00	0.00				
10.00	1.17	0.00	0.00				
10.25	1.25	0.00	0.00				
10.50	1.34	0.00	0.00				
10.75	1.44	0.00	0.00				
11.00	1.55	0.00	0.00				
11.25	1.68	0.00	0.00				
11.50	1.85	0.00	0.00				
11.75	2.20	0.00	0.00				
12.00	3.10	0.00	0.00				
12.25	4.00	0.05	0.00				
12.50	4.35	0.09	0.00				
12.75	4.52	0.11	0.00				
13.00	4.65	0.13	0.00				
13.25	4.76	0.15	0.00				
13.50	4.86	0.17	0.00				
13.75	4.95	0.19	0.00				
14.00	5.03	0.21	0.00				
14.25	5.10	0.22	0.00				
14.50	5.17	0.24	0.00				
14.75	5.24	0.25	0.00				
15.00	5.30	0.26	0.00				
15.25	5.35	0.28	0.00				
15.50	5.40	0.29	0.00				
15.75	5.45	0.30	0.00				
16.00	5.49	0.31	0.00				
16.25	5.53	0.32	0.00				
16.50	5.57	0.33	0.00				
16.75	5.61	0.34	0.00				
17.00	5.64	0.35	0.00				
17.25	5.67	0.36	0.00				
17.50	5.70	0.36	0.00				
17.75	5.73	0.37	0.00				

[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 6S: Impervious Area

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

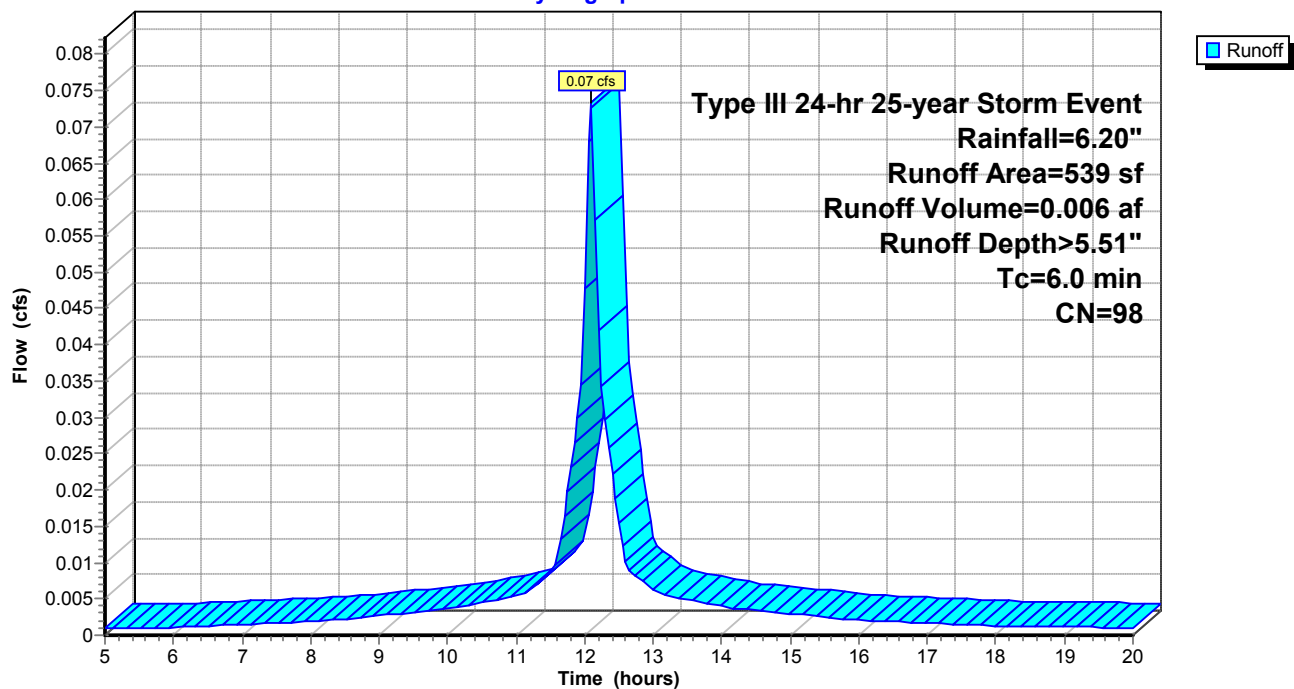
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
453	98	Driveway
86	98	Partial Roof
539	98	Weighted Average
539		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Impervious Area

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 6S: Impervious Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.19	0.00	18.00	5.75	5.52	0.00
5.25	0.37	0.21	0.00	18.25	5.78	5.54	0.00
5.50	0.40	0.23	0.00	18.50	5.80	5.56	0.00
5.75	0.42	0.25	0.00	18.75	5.83	5.59	0.00
6.00	0.45	0.27	0.00	19.00	5.85	5.61	0.00
6.25	0.47	0.29	0.00	19.25	5.87	5.63	0.00
6.50	0.50	0.32	0.00	19.50	5.89	5.65	0.00
6.75	0.53	0.34	0.00	19.75	5.91	5.67	0.00
7.00	0.56	0.37	0.00	20.00	5.93	5.70	0.00
7.25	0.59	0.40	0.00				
7.50	0.63	0.44	0.00				
7.75	0.67	0.47	0.00				
8.00	0.71	0.51	0.00				
8.25	0.75	0.55	0.00				
8.50	0.80	0.59	0.00				
8.75	0.85	0.64	0.00				
9.00	0.90	0.70	0.00				
9.25	0.96	0.76	0.00				
9.50	1.03	0.82	0.00				
9.75	1.10	0.89	0.00				
10.00	1.17	0.96	0.00				
10.25	1.25	1.04	0.00				
10.50	1.34	1.13	0.00				
10.75	1.44	1.22	0.00				
11.00	1.55	1.33	0.01				
11.25	1.68	1.46	0.01				
11.50	1.85	1.62	0.01				
11.75	2.20	1.98	0.02				
12.00	3.10	2.87	0.05				
12.25	4.00	3.76	0.03				
12.50	4.35	4.12	0.02				
12.75	4.52	4.28	0.01				
13.00	4.65	4.41	0.01				
13.25	4.76	4.52	0.01				
13.50	4.86	4.62	0.00				
13.75	4.95	4.71	0.00				
14.00	5.03	4.79	0.00				
14.25	5.10	4.86	0.00				
14.50	5.17	4.93	0.00				
14.75	5.24	5.00	0.00				
15.00	5.30	5.06	0.00				
15.25	5.35	5.11	0.00				
15.50	5.40	5.17	0.00				
15.75	5.45	5.21	0.00				
16.00	5.49	5.26	0.00				
16.25	5.53	5.29	0.00				
16.50	5.57	5.33	0.00				
16.75	5.61	5.37	0.00				
17.00	5.64	5.40	0.00				
17.25	5.67	5.43	0.00				
17.50	5.70	5.46	0.00				
17.75	5.73	5.49	0.00				

[1120] Proposed Conditions3

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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 7S: Walkway

Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

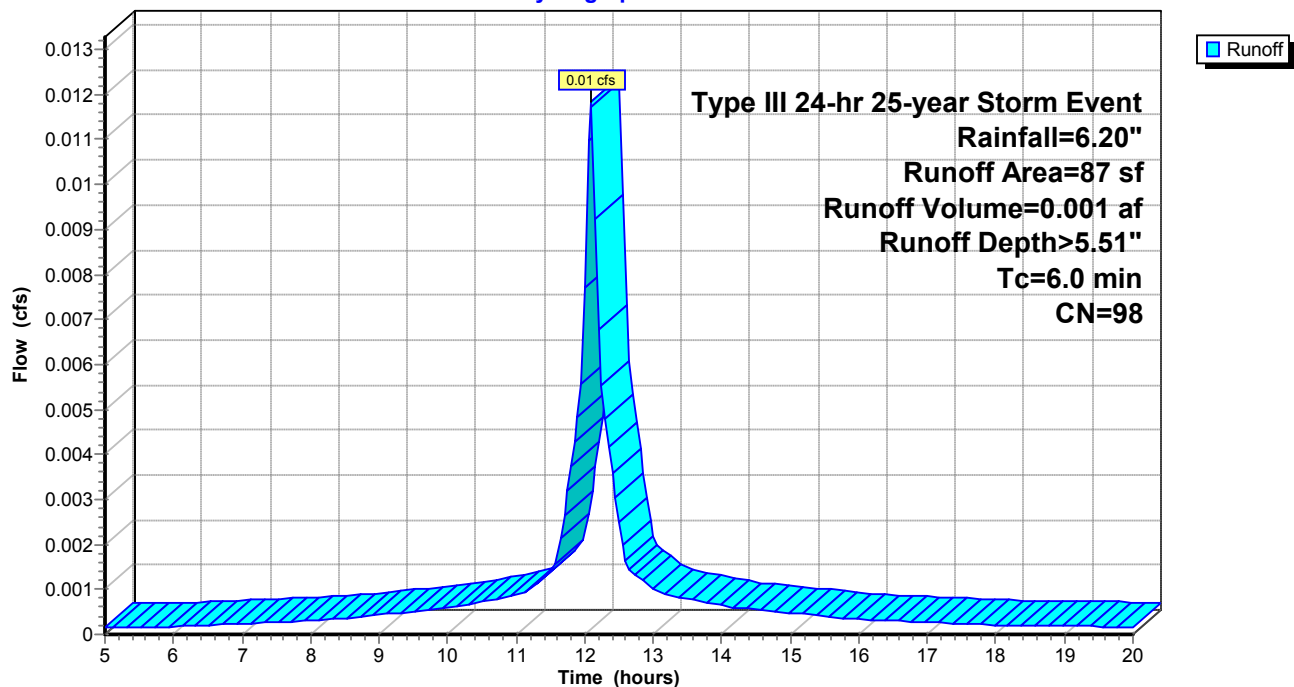
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
87	98	Paved parking & roofs
87		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.19	0.00	18.00	5.75	5.52	0.00
5.25	0.37	0.21	0.00	18.25	5.78	5.54	0.00
5.50	0.40	0.23	0.00	18.50	5.80	5.56	0.00
5.75	0.42	0.25	0.00	18.75	5.83	5.59	0.00
6.00	0.45	0.27	0.00	19.00	5.85	5.61	0.00
6.25	0.47	0.29	0.00	19.25	5.87	5.63	0.00
6.50	0.50	0.32	0.00	19.50	5.89	5.65	0.00
6.75	0.53	0.34	0.00	19.75	5.91	5.67	0.00
7.00	0.56	0.37	0.00	20.00	5.93	5.70	0.00
7.25	0.59	0.40	0.00				
7.50	0.63	0.44	0.00				
7.75	0.67	0.47	0.00				
8.00	0.71	0.51	0.00				
8.25	0.75	0.55	0.00				
8.50	0.80	0.59	0.00				
8.75	0.85	0.64	0.00				
9.00	0.90	0.70	0.00				
9.25	0.96	0.76	0.00				
9.50	1.03	0.82	0.00				
9.75	1.10	0.89	0.00				
10.00	1.17	0.96	0.00				
10.25	1.25	1.04	0.00				
10.50	1.34	1.13	0.00				
10.75	1.44	1.22	0.00				
11.00	1.55	1.33	0.00				
11.25	1.68	1.46	0.00				
11.50	1.85	1.62	0.00				
11.75	2.20	1.98	0.00				
12.00	3.10	2.87	0.01				
12.25	4.00	3.76	0.01				
12.50	4.35	4.12	0.00				
12.75	4.52	4.28	0.00				
13.00	4.65	4.41	0.00				
13.25	4.76	4.52	0.00				
13.50	4.86	4.62	0.00				
13.75	4.95	4.71	0.00				
14.00	5.03	4.79	0.00				
14.25	5.10	4.86	0.00				
14.50	5.17	4.93	0.00				
14.75	5.24	5.00	0.00				
15.00	5.30	5.06	0.00				
15.25	5.35	5.11	0.00				
15.50	5.40	5.17	0.00				
15.75	5.45	5.21	0.00				
16.00	5.49	5.26	0.00				
16.25	5.53	5.29	0.00				
16.50	5.57	5.33	0.00				
16.75	5.61	5.37	0.00				
17.00	5.64	5.40	0.00				
17.25	5.67	5.43	0.00				
17.50	5.70	5.46	0.00				
17.75	5.73	5.49	0.00				

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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

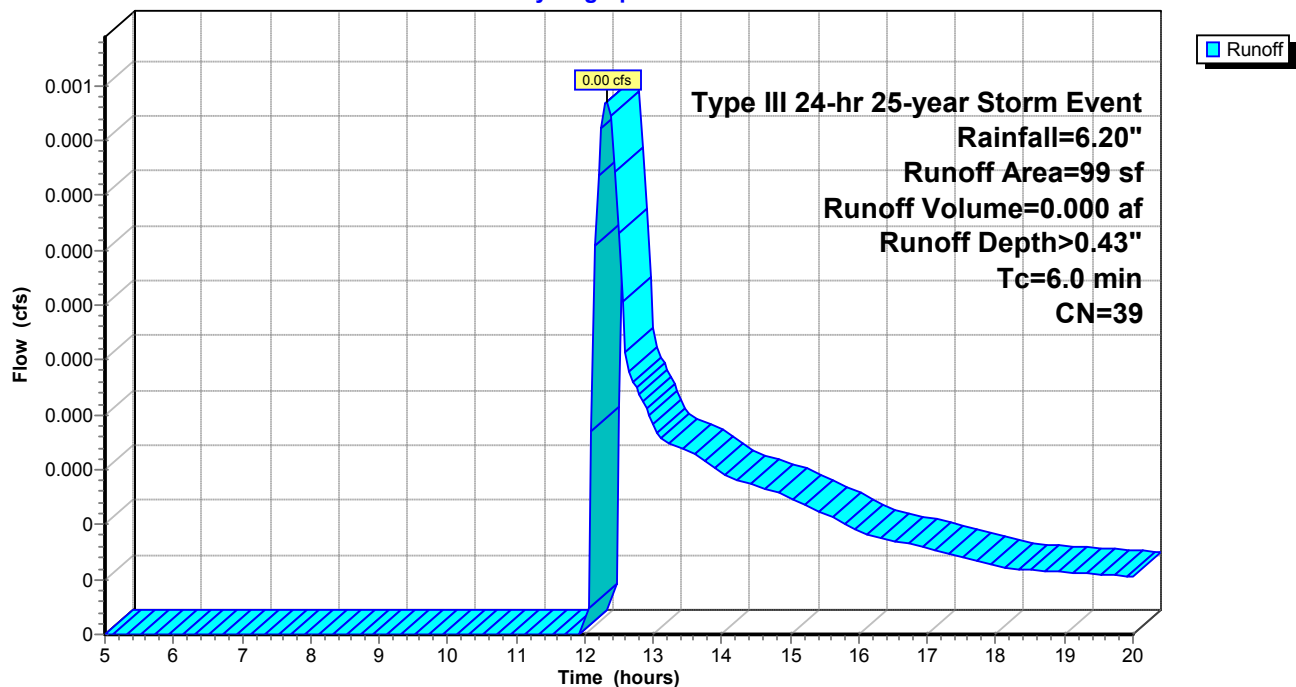
Type III 24-hr 25-year Storm Event Rainfall=6.20"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions3*Type III 24-hr 25-year Storm Event Rainfall=6.20"*

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.35	0.00	0.00	18.00	5.75	0.38	0.00
5.25	0.37	0.00	0.00	18.25	5.78	0.38	0.00
5.50	0.40	0.00	0.00	18.50	5.80	0.39	0.00
5.75	0.42	0.00	0.00	18.75	5.83	0.40	0.00
6.00	0.45	0.00	0.00	19.00	5.85	0.40	0.00
6.25	0.47	0.00	0.00	19.25	5.87	0.41	0.00
6.50	0.50	0.00	0.00	19.50	5.89	0.42	0.00
6.75	0.53	0.00	0.00	19.75	5.91	0.42	0.00
7.00	0.56	0.00	0.00	20.00	5.93	0.43	0.00
7.25	0.59	0.00	0.00				
7.50	0.63	0.00	0.00				
7.75	0.67	0.00	0.00				
8.00	0.71	0.00	0.00				
8.25	0.75	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.85	0.00	0.00				
9.00	0.90	0.00	0.00				
9.25	0.96	0.00	0.00				
9.50	1.03	0.00	0.00				
9.75	1.10	0.00	0.00				
10.00	1.17	0.00	0.00				
10.25	1.25	0.00	0.00				
10.50	1.34	0.00	0.00				
10.75	1.44	0.00	0.00				
11.00	1.55	0.00	0.00				
11.25	1.68	0.00	0.00				
11.50	1.85	0.00	0.00				
11.75	2.20	0.00	0.00				
12.00	3.10	0.00	0.00				
12.25	4.00	0.05	0.00				
12.50	4.35	0.09	0.00				
12.75	4.52	0.11	0.00				
13.00	4.65	0.13	0.00				
13.25	4.76	0.15	0.00				
13.50	4.86	0.17	0.00				
13.75	4.95	0.19	0.00				
14.00	5.03	0.21	0.00				
14.25	5.10	0.22	0.00				
14.50	5.17	0.24	0.00				
14.75	5.24	0.25	0.00				
15.00	5.30	0.26	0.00				
15.25	5.35	0.28	0.00				
15.50	5.40	0.29	0.00				
15.75	5.45	0.30	0.00				
16.00	5.49	0.31	0.00				
16.25	5.53	0.32	0.00				
16.50	5.57	0.33	0.00				
16.75	5.61	0.34	0.00				
17.00	5.64	0.35	0.00				
17.25	5.67	0.36	0.00				
17.50	5.70	0.36	0.00				
17.75	5.73	0.37	0.00				

[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 2.80" for 25-year Storm Event event
 Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 11.95 hrs, Volume= 0.001 af, Atten= 58%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.95 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.76' @ 12.32 hrs Surf.Area= 0 sf Storage= 5 cf

Plug-Flow detention time= 4.4 min calculated for 0.001 af (100% of inflow)
 Center-of-Mass det. time= 4.2 min (750.3 - 746.2)

Volume	Invert	Avail.Storage	Storage Description
#1	3.62'	19 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.62	0
4.20	19

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.62 3.63 4.20 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 11.95 hrs HW=3.63' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions3

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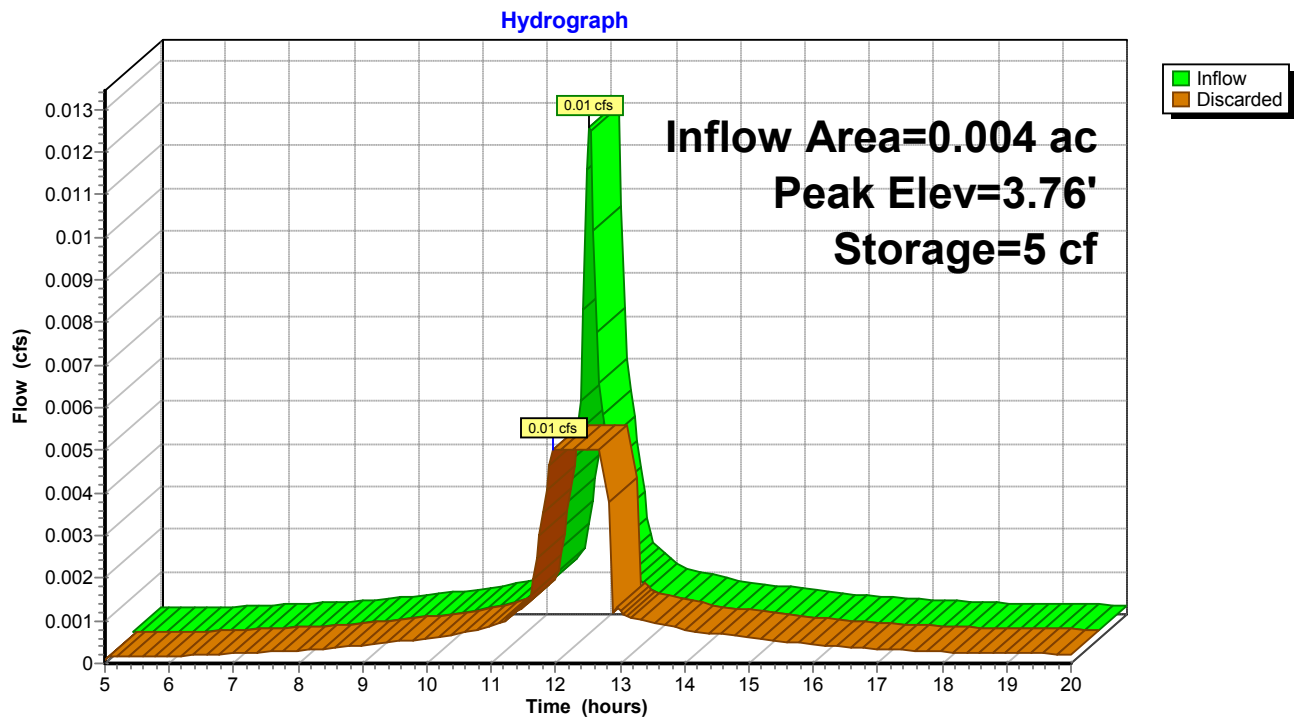
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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions3*Type III 24-hr 25-year Storm Event Rainfall=6.20"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.62	0.00
5.50	0.00	0	3.62	0.00
6.00	0.00	0	3.62	0.00
6.50	0.00	0	3.62	0.00
7.00	0.00	0	3.62	0.00
7.50	0.00	0	3.62	0.00
8.00	0.00	0	3.62	0.00
8.50	0.00	0	3.62	0.00
9.00	0.00	0	3.62	0.00
9.50	0.00	0	3.62	0.00
10.00	0.00	0	3.62	0.00
10.50	0.00	0	3.62	0.00
11.00	0.00	0	3.62	0.00
11.50	0.00	0	3.62	0.00
12.00	0.01	1	3.64	0.01
12.50	0.00	4	3.74	0.01
13.00	0.00	0	3.62	0.00
13.50	0.00	0	3.62	0.00
14.00	0.00	0	3.62	0.00
14.50	0.00	0	3.62	0.00
15.00	0.00	0	3.62	0.00
15.50	0.00	0	3.62	0.00
16.00	0.00	0	3.62	0.00
16.50	0.00	0	3.62	0.00
17.00	0.00	0	3.62	0.00
17.50	0.00	0	3.62	0.00
18.00	0.00	0	3.62	0.00
18.50	0.00	0	3.62	0.00
19.00	0.00	0	3.62	0.00
19.50	0.00	0	3.62	0.00
20.00	0.00	0	3.62	0.00

[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.018 ac, Inflow Depth > 3.93" for 25-year Storm Event event
 Inflow = 0.07 cfs @ 12.09 hrs, Volume= 0.006 af
 Outflow = 0.03 cfs @ 11.85 hrs, Volume= 0.006 af, Atten= 66%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.85 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.42' @ 12.38 hrs Surf.Area= 0 sf Storage= 37 cf

Plug-Flow detention time= 7.0 min calculated for 0.006 af (100% of inflow)
 Center-of-Mass det. time= 6.7 min (745.8 - 739.1)

Volume	Invert	Avail.Storage	Storage Description
#1	3.17'	87 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.17	0
3.75	87

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.17 3.18 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 11.85 hrs HW=3.18' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions3

Prepared by Gala Simon Associates

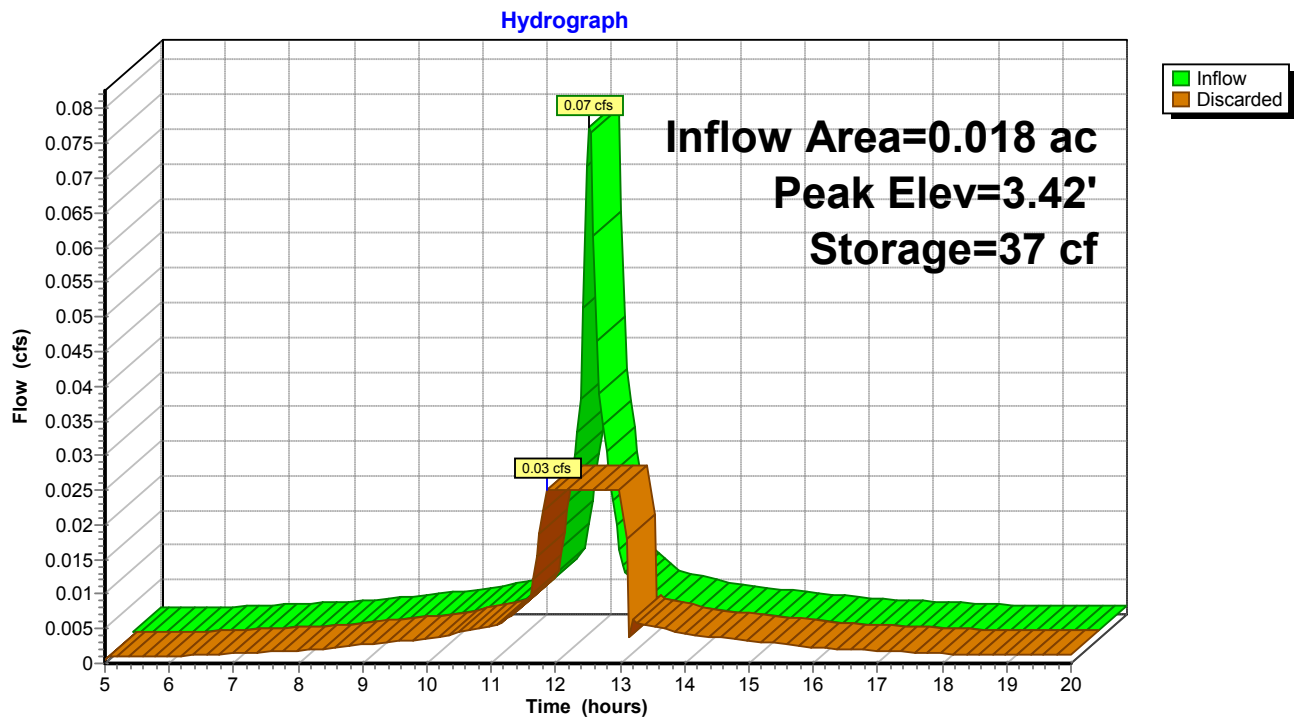
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Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions3

Type III 24-hr 25-year Storm Event Rainfall=6.20"

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.17	0.00
5.50	0.00	0	3.17	0.00
6.00	0.00	0	3.17	0.00
6.50	0.00	0	3.17	0.00
7.00	0.00	0	3.17	0.00
7.50	0.00	0	3.17	0.00
8.00	0.00	0	3.17	0.00
8.50	0.00	0	3.17	0.00
9.00	0.00	0	3.17	0.00
9.50	0.00	0	3.17	0.00
10.00	0.00	0	3.17	0.00
10.50	0.00	0	3.17	0.00
11.00	0.01	0	3.17	0.01
11.50	0.01	0	3.17	0.01
12.00	0.05	6	3.21	0.03
12.50	0.02	35	3.41	0.03
13.00	0.01	7	3.22	0.03
13.50	0.01	0	3.17	0.01
14.00	0.00	0	3.17	0.00
14.50	0.00	0	3.17	0.00
15.00	0.00	0	3.17	0.00
15.50	0.00	0	3.17	0.00
16.00	0.00	0	3.17	0.00
16.50	0.00	0	3.17	0.00
17.00	0.00	0	3.17	0.00
17.50	0.00	0	3.17	0.00
18.00	0.00	0	3.17	0.00
18.50	0.00	0	3.17	0.00
19.00	0.00	0	3.17	0.00
19.50	0.00	0	3.17	0.00
20.00	0.00	0	3.17	0.00

[1120] Proposed Conditions3

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 1S: Remainder of Land

Runoff = 0.41 cfs @ 12.10 hrs, Volume= 0.027 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

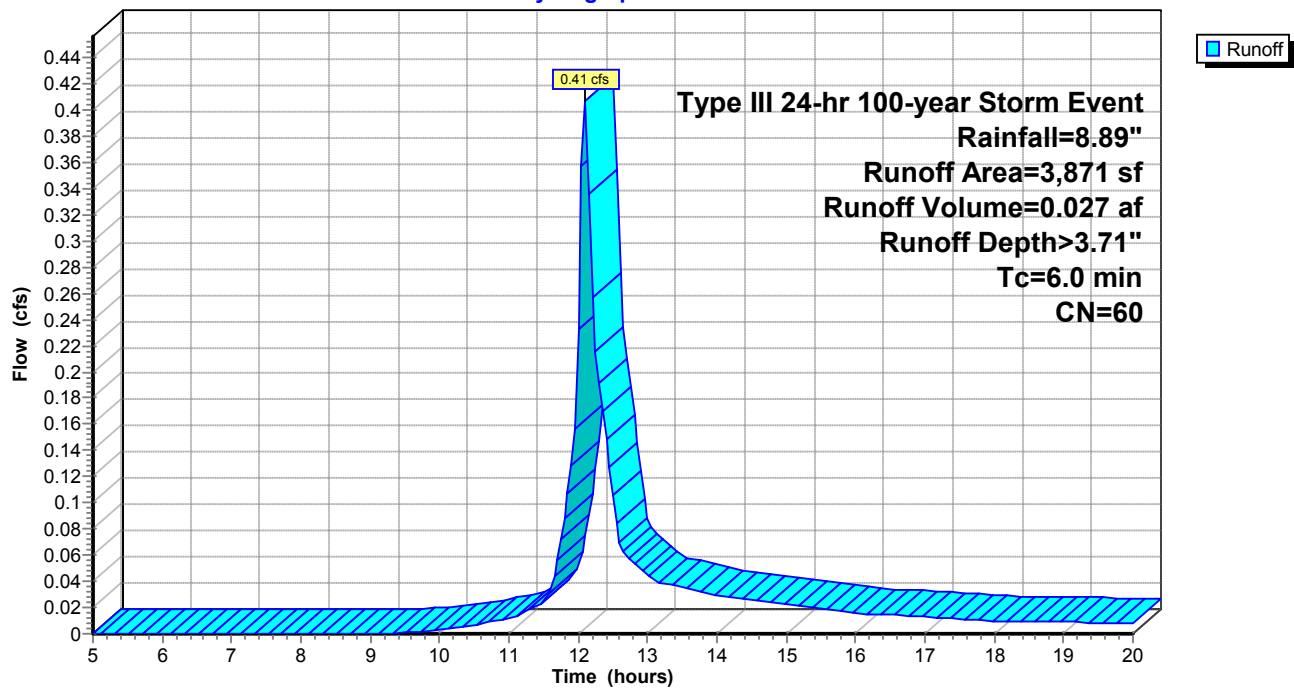
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
1,373	98	Paved parking & roofs
2,498	39	>75% Grass cover, Good, HSG A
3,871	60	Weighted Average
2,498		Pervious Area
1,373		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 1S: Remainder of Land

Hydrograph



[1120] Proposed Conditions3*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Subcatchment 1S: Remainder of Land

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	3.52	0.01
5.25	0.54	0.00	0.00	18.25	8.29	3.55	0.01
5.50	0.57	0.00	0.00	18.50	8.32	3.57	0.01
5.75	0.60	0.00	0.00	18.75	8.35	3.60	0.01
6.00	0.64	0.00	0.00	19.00	8.39	3.63	0.01
6.25	0.68	0.00	0.00	19.25	8.42	3.65	0.01
6.50	0.72	0.00	0.00	19.50	8.45	3.67	0.01
6.75	0.76	0.00	0.00	19.75	8.48	3.70	0.01
7.00	0.80	0.00	0.00	20.00	8.51	3.72	0.01
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.00	0.00				
8.00	1.01	0.00	0.00				
8.25	1.07	0.00	0.00				
8.50	1.14	0.00	0.00				
8.75	1.22	0.00	0.00				
9.00	1.30	0.00	0.00				
9.25	1.38	0.00	0.00				
9.50	1.48	0.00	0.00				
9.75	1.57	0.01	0.00				
10.00	1.68	0.02	0.00				
10.25	1.80	0.03	0.00				
10.50	1.92	0.05	0.01				
10.75	2.07	0.07	0.01				
11.00	2.22	0.10	0.01				
11.25	2.41	0.15	0.02				
11.50	2.65	0.22	0.03				
11.75	3.16	0.39	0.07				
12.00	4.44	0.99	0.23				
12.25	5.73	1.75	0.22				
12.50	6.24	2.08	0.11				
12.75	6.48	2.24	0.06				
13.00	6.67	2.37	0.04				
13.25	6.82	2.48	0.04				
13.50	6.97	2.58	0.04				
13.75	7.09	2.67	0.03				
14.00	7.21	2.75	0.03				
14.25	7.32	2.83	0.03				
14.50	7.41	2.90	0.03				
14.75	7.51	2.97	0.02				
15.00	7.59	3.03	0.02				
15.25	7.67	3.09	0.02				
15.50	7.75	3.15	0.02				
15.75	7.82	3.20	0.02				
16.00	7.88	3.24	0.02				
16.25	7.93	3.28	0.01				
16.50	7.99	3.32	0.01				
16.75	8.04	3.36	0.01				
17.00	8.09	3.40	0.01				
17.25	8.13	3.43	0.01				
17.50	8.17	3.46	0.01				
17.75	8.21	3.49	0.01				

[1120] Proposed Conditions3

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 2S: Lawn

Runoff = 0.01 cfs @ 12.12 hrs, Volume= 0.001 af, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

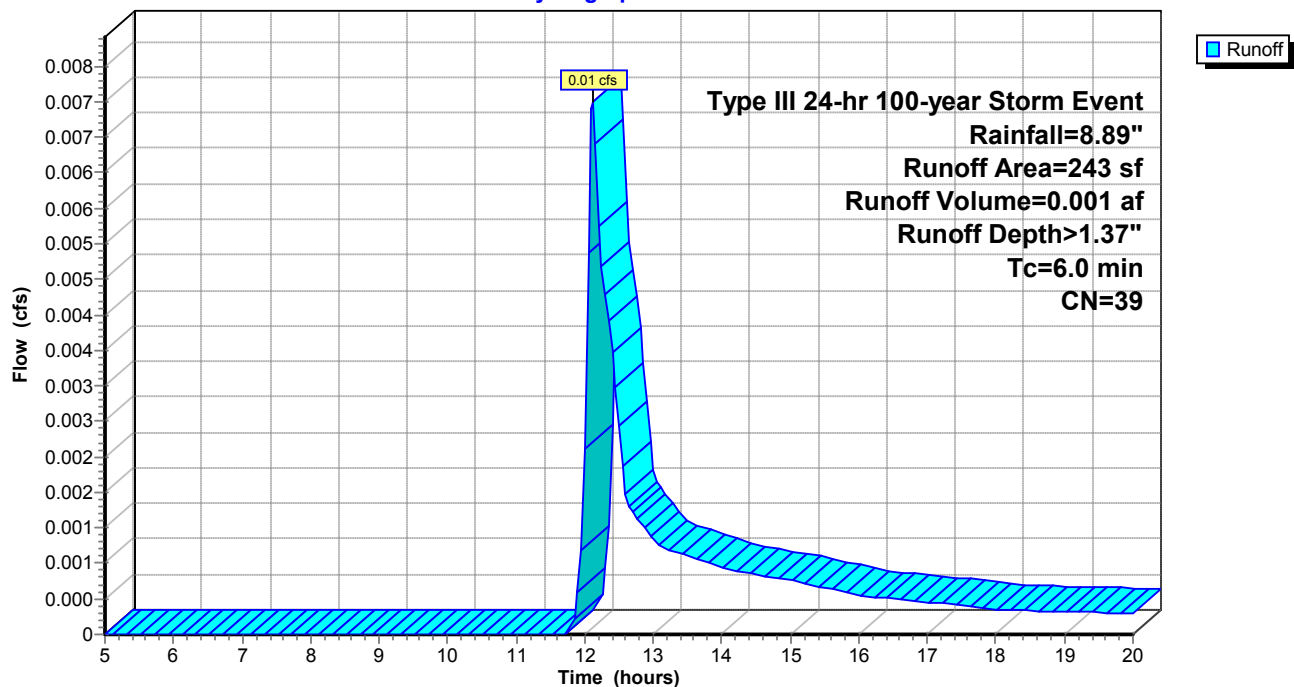
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
243	39	>75% Grass cover, Good, HSG A
243		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 2S: Lawn

Hydrograph



[1120] Proposed Conditions3*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Subcatchment 2S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	1.26	0.00
5.25	0.54	0.00	0.00	18.25	8.29	1.28	0.00
5.50	0.57	0.00	0.00	18.50	8.32	1.29	0.00
5.75	0.60	0.00	0.00	18.75	8.35	1.31	0.00
6.00	0.64	0.00	0.00	19.00	8.39	1.32	0.00
6.25	0.68	0.00	0.00	19.25	8.42	1.34	0.00
6.50	0.72	0.00	0.00	19.50	8.45	1.35	0.00
6.75	0.76	0.00	0.00	19.75	8.48	1.36	0.00
7.00	0.80	0.00	0.00	20.00	8.51	1.38	0.00
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.00	0.00				
8.00	1.01	0.00	0.00				
8.25	1.07	0.00	0.00				
8.50	1.14	0.00	0.00				
8.75	1.22	0.00	0.00				
9.00	1.30	0.00	0.00				
9.25	1.38	0.00	0.00				
9.50	1.48	0.00	0.00				
9.75	1.57	0.00	0.00				
10.00	1.68	0.00	0.00				
10.25	1.80	0.00	0.00				
10.50	1.92	0.00	0.00				
10.75	2.07	0.00	0.00				
11.00	2.22	0.00	0.00				
11.25	2.41	0.00	0.00				
11.50	2.65	0.00	0.00				
11.75	3.16	0.00	0.00				
12.00	4.44	0.10	0.00				
12.25	5.73	0.37	0.01				
12.50	6.24	0.52	0.00				
12.75	6.48	0.59	0.00				
13.00	6.67	0.65	0.00				
13.25	6.82	0.71	0.00				
13.50	6.97	0.76	0.00				
13.75	7.09	0.80	0.00				
14.00	7.21	0.84	0.00				
14.25	7.32	0.88	0.00				
14.50	7.41	0.92	0.00				
14.75	7.51	0.96	0.00				
15.00	7.59	0.99	0.00				
15.25	7.67	1.02	0.00				
15.50	7.75	1.05	0.00				
15.75	7.82	1.08	0.00				
16.00	7.88	1.11	0.00				
16.25	7.93	1.13	0.00				
16.50	7.99	1.15	0.00				
16.75	8.04	1.17	0.00				
17.00	8.09	1.19	0.00				
17.25	8.13	1.21	0.00				
17.50	8.17	1.23	0.00				
17.75	8.21	1.25	0.00				

[1120] Proposed Conditions3

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 6S: Impervious Area

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Depth> 7.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

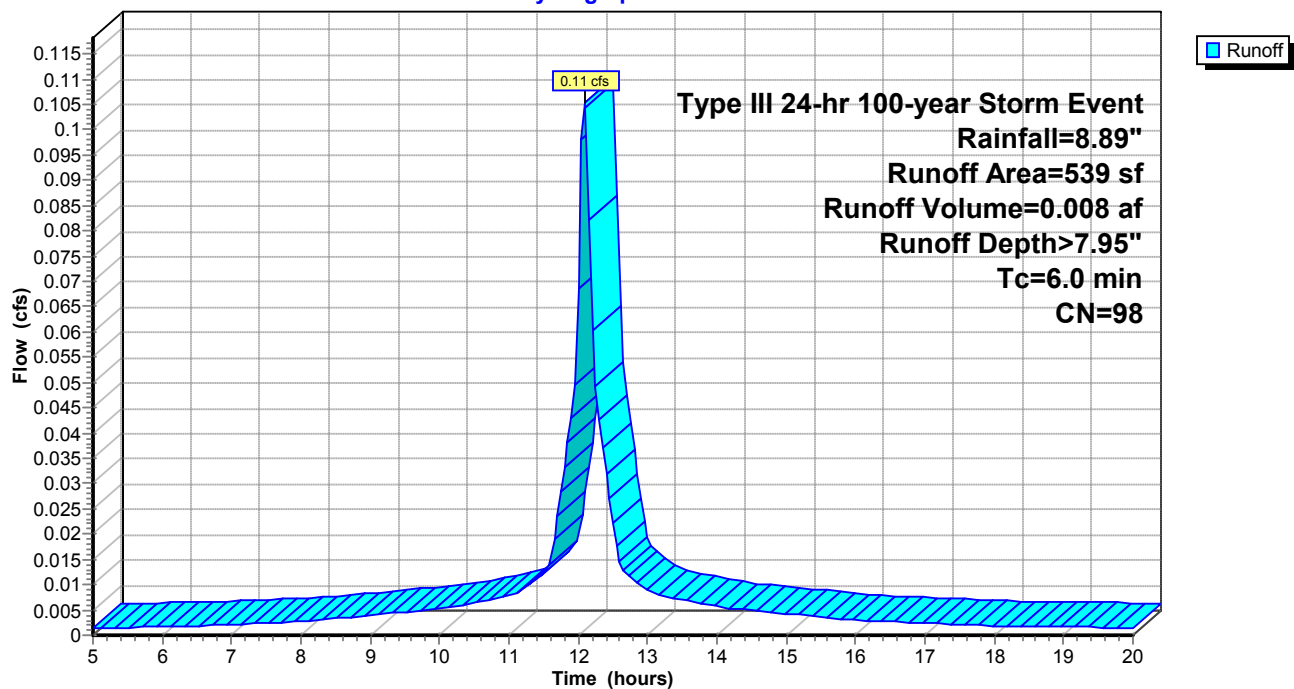
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
453	98	Driveway
86	98	Partial Roof
539	98	Weighted Average
539		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 6S: Impervious Area

Hydrograph



[1120] Proposed Conditions3*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Subcatchment 6S: Impervious Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.32	0.00	18.00	8.25	8.01	0.00
5.25	0.54	0.35	0.00	18.25	8.29	8.05	0.00
5.50	0.57	0.38	0.00	18.50	8.32	8.08	0.00
5.75	0.60	0.41	0.00	18.75	8.35	8.11	0.00
6.00	0.64	0.45	0.00	19.00	8.39	8.15	0.00
6.25	0.68	0.48	0.00	19.25	8.42	8.18	0.00
6.50	0.72	0.52	0.00	19.50	8.45	8.21	0.00
6.75	0.76	0.56	0.00	19.75	8.48	8.24	0.00
7.00	0.80	0.60	0.00	20.00	8.51	8.27	0.00
7.25	0.85	0.65	0.00				
7.50	0.90	0.70	0.00				
7.75	0.96	0.75	0.00				
8.00	1.01	0.80	0.00				
8.25	1.07	0.86	0.00				
8.50	1.14	0.93	0.00				
8.75	1.22	1.00	0.00				
9.00	1.30	1.08	0.00				
9.25	1.38	1.16	0.00				
9.50	1.48	1.26	0.00				
9.75	1.57	1.35	0.00				
10.00	1.68	1.46	0.01				
10.25	1.80	1.57	0.01				
10.50	1.92	1.70	0.01				
10.75	2.07	1.84	0.01				
11.00	2.22	2.00	0.01				
11.25	2.41	2.18	0.01				
11.50	2.65	2.42	0.01				
11.75	3.16	2.93	0.03				
12.00	4.44	4.21	0.07				
12.25	5.73	5.49	0.05				
12.50	6.24	6.00	0.02				
12.75	6.48	6.24	0.01				
13.00	6.67	6.43	0.01				
13.25	6.82	6.58	0.01				
13.50	6.97	6.73	0.01				
13.75	7.09	6.86	0.01				
14.00	7.21	6.97	0.01				
14.25	7.32	7.08	0.01				
14.50	7.41	7.18	0.00				
14.75	7.51	7.27	0.00				
15.00	7.59	7.35	0.00				
15.25	7.67	7.43	0.00				
15.50	7.75	7.51	0.00				
15.75	7.82	7.58	0.00				
16.00	7.88	7.64	0.00				
16.25	7.93	7.69	0.00				
16.50	7.99	7.75	0.00				
16.75	8.04	7.80	0.00				
17.00	8.09	7.85	0.00				
17.25	8.13	7.89	0.00				
17.50	8.17	7.93	0.00				
17.75	8.21	7.97	0.00				

[1120] Proposed Conditions3

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 7S: Walkway

Runoff = 0.02 cfs @ 12.09 hrs, Volume= 0.001 af, Depth> 7.95"

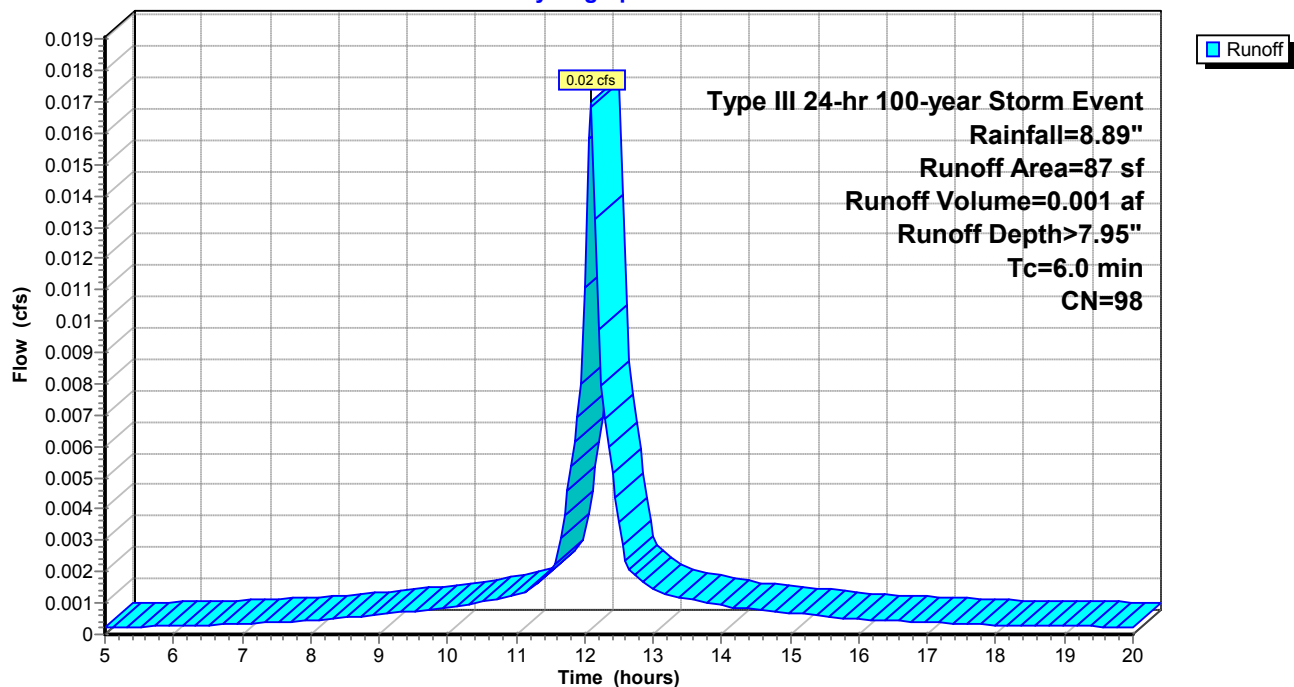
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
87	98	Paved parking & roofs
87		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 7S: Walkway

Hydrograph



[1120] Proposed Conditions3

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Hydrograph for Subcatchment 7S: Walkway

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.32	0.00	18.00	8.25	8.01	0.00
5.25	0.54	0.35	0.00	18.25	8.29	8.05	0.00
5.50	0.57	0.38	0.00	18.50	8.32	8.08	0.00
5.75	0.60	0.41	0.00	18.75	8.35	8.11	0.00
6.00	0.64	0.45	0.00	19.00	8.39	8.15	0.00
6.25	0.68	0.48	0.00	19.25	8.42	8.18	0.00
6.50	0.72	0.52	0.00	19.50	8.45	8.21	0.00
6.75	0.76	0.56	0.00	19.75	8.48	8.24	0.00
7.00	0.80	0.60	0.00	20.00	8.51	8.27	0.00
7.25	0.85	0.65	0.00				
7.50	0.90	0.70	0.00				
7.75	0.96	0.75	0.00				
8.00	1.01	0.80	0.00				
8.25	1.07	0.86	0.00				
8.50	1.14	0.93	0.00				
8.75	1.22	1.00	0.00				
9.00	1.30	1.08	0.00				
9.25	1.38	1.16	0.00				
9.50	1.48	1.26	0.00				
9.75	1.57	1.35	0.00				
10.00	1.68	1.46	0.00				
10.25	1.80	1.57	0.00				
10.50	1.92	1.70	0.00				
10.75	2.07	1.84	0.00				
11.00	2.22	2.00	0.00				
11.25	2.41	2.18	0.00				
11.50	2.65	2.42	0.00				
11.75	3.16	2.93	0.00				
12.00	4.44	4.21	0.01				
12.25	5.73	5.49	0.01				
12.50	6.24	6.00	0.00				
12.75	6.48	6.24	0.00				
13.00	6.67	6.43	0.00				
13.25	6.82	6.58	0.00				
13.50	6.97	6.73	0.00				
13.75	7.09	6.86	0.00				
14.00	7.21	6.97	0.00				
14.25	7.32	7.08	0.00				
14.50	7.41	7.18	0.00				
14.75	7.51	7.27	0.00				
15.00	7.59	7.35	0.00				
15.25	7.67	7.43	0.00				
15.50	7.75	7.51	0.00				
15.75	7.82	7.58	0.00				
16.00	7.88	7.64	0.00				
16.25	7.93	7.69	0.00				
16.50	7.99	7.75	0.00				
16.75	8.04	7.80	0.00				
17.00	8.09	7.85	0.00				
17.25	8.13	7.89	0.00				
17.50	8.17	7.93	0.00				
17.75	8.21	7.97	0.00				

[1120] Proposed Conditions3

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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Subcatchment 8S: Lawn

Runoff = 0.00 cfs @ 12.12 hrs, Volume= 0.000 af, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

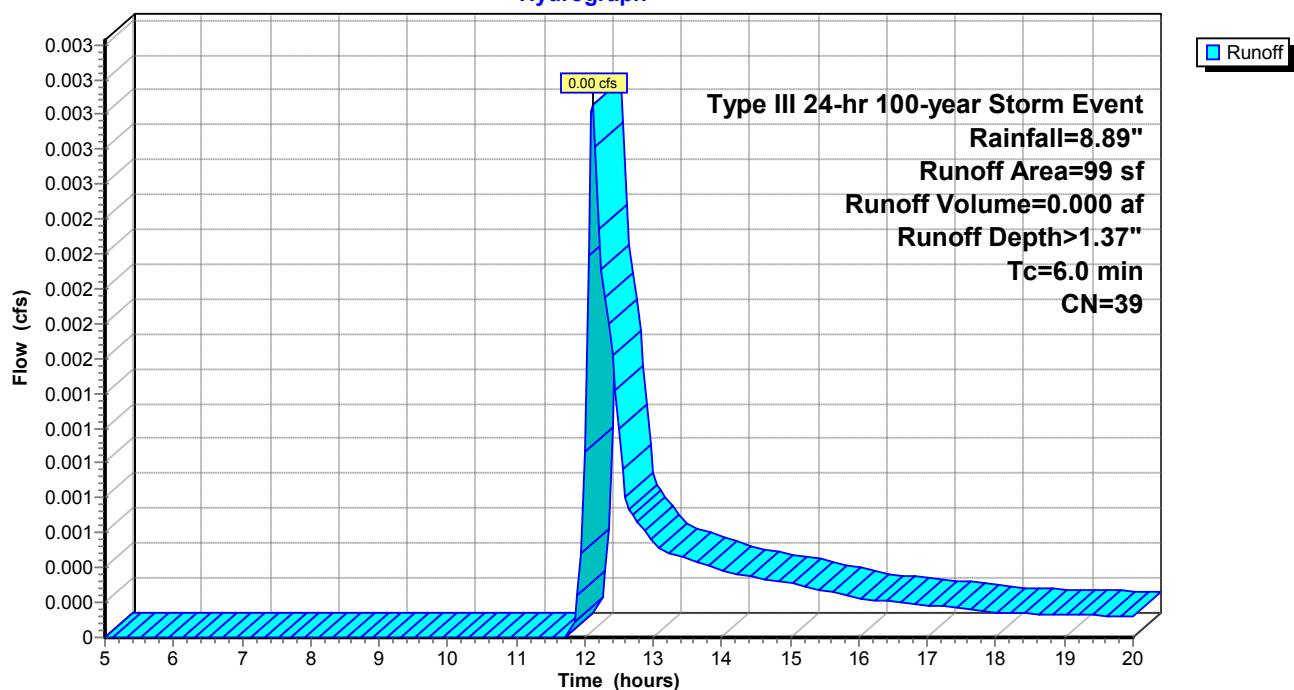
Type III 24-hr 100-year Storm Event Rainfall=8.89"

Area (sf)	CN	Description
99	39	>75% Grass cover, Good, HSG A
99		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 8S: Lawn

Hydrograph



[1120] Proposed Conditions3*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Subcatchment 8S: Lawn

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.50	0.00	0.00	18.00	8.25	1.26	0.00
5.25	0.54	0.00	0.00	18.25	8.29	1.28	0.00
5.50	0.57	0.00	0.00	18.50	8.32	1.29	0.00
5.75	0.60	0.00	0.00	18.75	8.35	1.31	0.00
6.00	0.64	0.00	0.00	19.00	8.39	1.32	0.00
6.25	0.68	0.00	0.00	19.25	8.42	1.34	0.00
6.50	0.72	0.00	0.00	19.50	8.45	1.35	0.00
6.75	0.76	0.00	0.00	19.75	8.48	1.36	0.00
7.00	0.80	0.00	0.00	20.00	8.51	1.38	0.00
7.25	0.85	0.00	0.00				
7.50	0.90	0.00	0.00				
7.75	0.96	0.00	0.00				
8.00	1.01	0.00	0.00				
8.25	1.07	0.00	0.00				
8.50	1.14	0.00	0.00				
8.75	1.22	0.00	0.00				
9.00	1.30	0.00	0.00				
9.25	1.38	0.00	0.00				
9.50	1.48	0.00	0.00				
9.75	1.57	0.00	0.00				
10.00	1.68	0.00	0.00				
10.25	1.80	0.00	0.00				
10.50	1.92	0.00	0.00				
10.75	2.07	0.00	0.00				
11.00	2.22	0.00	0.00				
11.25	2.41	0.00	0.00				
11.50	2.65	0.00	0.00				
11.75	3.16	0.00	0.00				
12.00	4.44	0.10	0.00				
12.25	5.73	0.37	0.00				
12.50	6.24	0.52	0.00				
12.75	6.48	0.59	0.00				
13.00	6.67	0.65	0.00				
13.25	6.82	0.71	0.00				
13.50	6.97	0.76	0.00				
13.75	7.09	0.80	0.00				
14.00	7.21	0.84	0.00				
14.25	7.32	0.88	0.00				
14.50	7.41	0.92	0.00				
14.75	7.51	0.96	0.00				
15.00	7.59	0.99	0.00				
15.25	7.67	1.02	0.00				
15.50	7.75	1.05	0.00				
15.75	7.82	1.08	0.00				
16.00	7.88	1.11	0.00				
16.25	7.93	1.13	0.00				
16.50	7.99	1.15	0.00				
16.75	8.04	1.17	0.00				
17.00	8.09	1.19	0.00				
17.25	8.13	1.21	0.00				
17.50	8.17	1.23	0.00				
17.75	8.21	1.25	0.00				

[1120] Proposed Conditions3

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 5P: Porous Paver (Walkway)

Inflow Area = 0.004 ac, Inflow Depth > 4.45" for 100-year Storm Event event
 Inflow = 0.02 cfs @ 12.09 hrs, Volume= 0.002 af
 Outflow = 0.01 cfs @ 11.80 hrs, Volume= 0.002 af, Atten= 75%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 11.80 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 4.04' @ 12.49 hrs Surf.Area= 0 sf Storage= 14 cf

Plug-Flow detention time= 14.0 min calculated for 0.002 af (100% of inflow)
 Center-of-Mass det. time= 13.7 min (765.1 - 751.4)

Volume	Invert	Avail.Storage	Storage Description
#1	3.62'	19 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.62	0
4.20	19

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.62 3.63 4.20 Disch. (cfs) 0.000 0.005 0.005

Discarded OutFlow Max=0.01 cfs @ 11.80 hrs HW=3.63' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.01 cfs)

[1120] Proposed Conditions3

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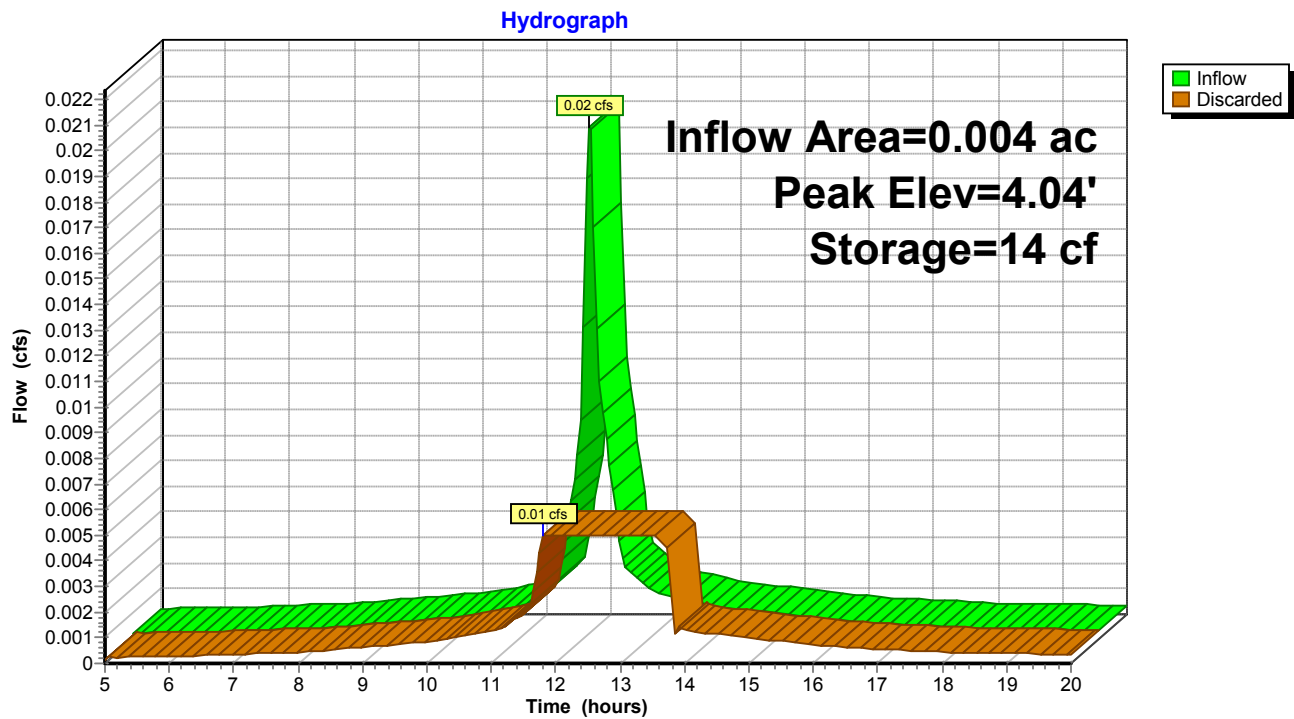
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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 5P: Porous Paver (Walkway)



[1120] Proposed Conditions3*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Pond 5P: Porous Paver (Walkway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.62	0.00
5.50	0.00	0	3.62	0.00
6.00	0.00	0	3.62	0.00
6.50	0.00	0	3.62	0.00
7.00	0.00	0	3.62	0.00
7.50	0.00	0	3.62	0.00
8.00	0.00	0	3.62	0.00
8.50	0.00	0	3.62	0.00
9.00	0.00	0	3.62	0.00
9.50	0.00	0	3.62	0.00
10.00	0.00	0	3.62	0.00
10.50	0.00	0	3.62	0.00
11.00	0.00	0	3.62	0.00
11.50	0.00	0	3.62	0.00
12.00	0.01	2	3.69	0.01
12.50	0.00	14	4.04	0.01
13.00	0.00	10	3.92	0.01
13.50	0.00	4	3.74	0.01
14.00	0.00	0	3.62	0.00
14.50	0.00	0	3.62	0.00
15.00	0.00	0	3.62	0.00
15.50	0.00	0	3.62	0.00
16.00	0.00	0	3.62	0.00
16.50	0.00	0	3.62	0.00
17.00	0.00	0	3.62	0.00
17.50	0.00	0	3.62	0.00
18.00	0.00	0	3.62	0.00
18.50	0.00	0	3.62	0.00
19.00	0.00	0	3.62	0.00
19.50	0.00	0	3.62	0.00
20.00	0.00	0	3.62	0.00

[1120] Proposed Conditions3

Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 9P: Porous Paver (Driveway)

Inflow Area = 0.018 ac, Inflow Depth > 5.91" for 100-year Storm Event event
 Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.009 af
 Outflow = 0.03 cfs @ 11.75 hrs, Volume= 0.009 af, Atten= 78%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.75 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 3.75' @ 12.50 hrs Surf.Area= 0 sf Storage= 86 cf

Plug-Flow detention time= 18.1 min calculated for 0.009 af (100% of inflow)
 Center-of-Mass det. time= 17.8 min (758.7 - 740.9)

Volume	Invert	Avail.Storage	Storage Description
#1	3.17'	87 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
3.17	0
3.75	87

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	Special & User-Defined Elev. (feet) 3.17 3.18 3.75 Disch. (cfs) 0.000 0.025 0.025

Discarded OutFlow Max=0.03 cfs @ 11.75 hrs HW=3.18' (Free Discharge)
 ↑1=Special & User-Defined (Custom Controls 0.03 cfs)

[1120] Proposed Conditions3

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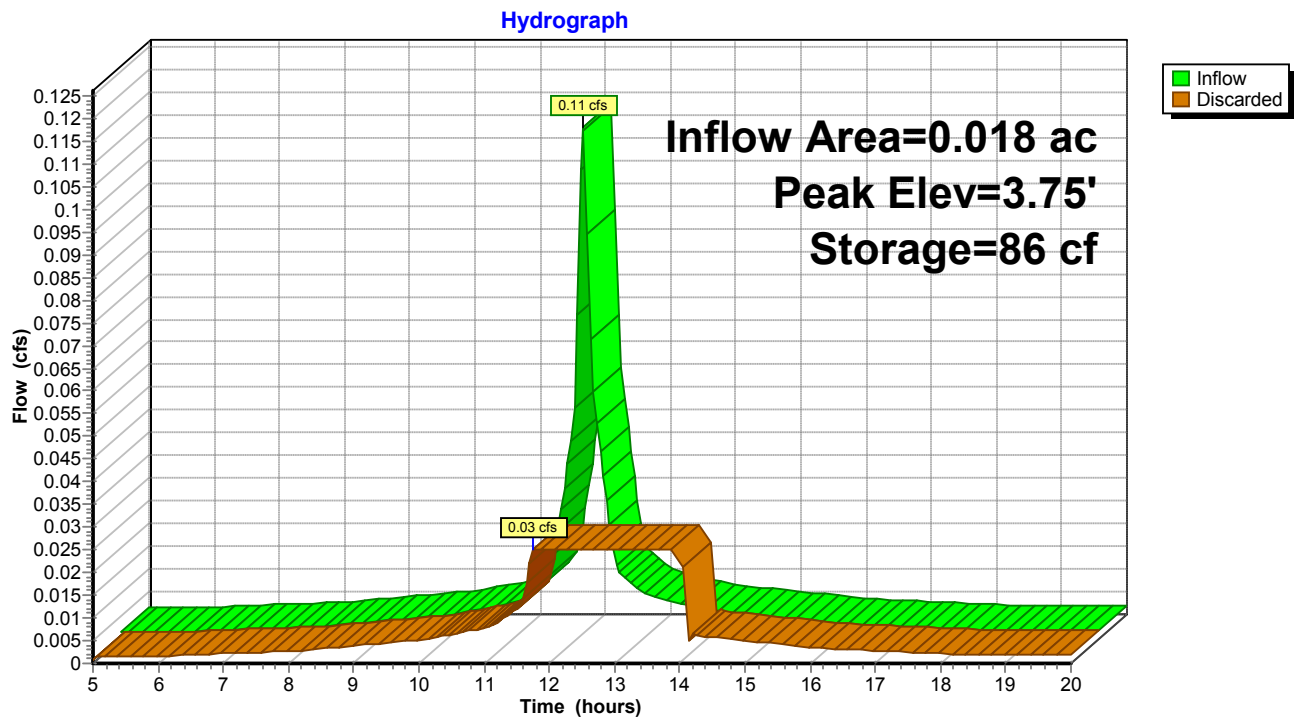
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Type III 24-hr 100-year Storm Event Rainfall=8.89"

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Pond 9P: Porous Paver (Driveway)



[1120] Proposed Conditions3*Type III 24-hr 100-year Storm Event Rainfall=8.89"*

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Hydrograph for Pond 9P: Porous Paver (Driveway)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Discarded (cfs)
5.00	0.00	0	3.17	0.00
5.50	0.00	0	3.17	0.00
6.00	0.00	0	3.17	0.00
6.50	0.00	0	3.17	0.00
7.00	0.00	0	3.17	0.00
7.50	0.00	0	3.17	0.00
8.00	0.00	0	3.17	0.00
8.50	0.00	0	3.17	0.00
9.00	0.00	0	3.17	0.00
9.50	0.00	0	3.17	0.00
10.00	0.01	0	3.17	0.01
10.50	0.01	0	3.17	0.01
11.00	0.01	0	3.17	0.01
11.50	0.01	1	3.17	0.01
12.00	0.07	18	3.29	0.03
12.50	0.03	86	3.75	0.03
13.00	0.01	67	3.62	0.03
13.50	0.01	38	3.42	0.03
14.00	0.01	6	3.21	0.03
14.50	0.01	0	3.17	0.01
15.00	0.01	0	3.17	0.01
15.50	0.00	0	3.17	0.00
16.00	0.00	0	3.17	0.00
16.50	0.00	0	3.17	0.00
17.00	0.00	0	3.17	0.00
17.50	0.00	0	3.17	0.00
18.00	0.00	0	3.17	0.00
18.50	0.00	0	3.17	0.00
19.00	0.00	0	3.17	0.00
19.50	0.00	0	3.17	0.00
20.00	0.00	0	3.17	0.00

***Operation
and
Maintenance
of
Drainage Systems***

Operation and Maintenance Plan for Drainage Systems

Project Name: 105 Lafayette Street, Arlington, MA

Date: March 26, 2020
Revised May 11, 2020

Site Location: 105 Lafayette Street
Arlington, Massachusetts

Site Operator:
Owner: Lori Philbin
Contact: 781-646-4101

The following Operation and Maintenance Plan (O & M Plan) has been developed to comply with DEP's Stormwater Management Policy. The responsibilities outlined in the O&M Plan run with ownership of the property.

Pervious Pavement

- Control of sediment is important to maintain the permeability of pervious pavements.
- The performance of the pavements shall be verified by the in-field test methodology described in ASTM C-1701 upon completion of paving activities.

Ensure proper operation of Porous Pavements

- Keep silt and debris from entering onto the pervious pavements
- Pavements shall not be sealed under any circumstances
- Sand or other abrasives for snow or ice conditions shall not be used as they reduce permeability of the pavements
- Observe the pavement surface for signs of sediment or organic debris accumulation
- Use high performance, regenerative air vacuum equipment to clean surfaces. Mechanical brooms shall not be used.

Semiannually inspection for proper functioning and look for:

- Standing water on pavement surface.
- Ruts or deformations in pavement exceeding ½".
- Small random cracks should not be sealed.
- Surrounding vegetation is to be well kept to prevent sedimentation to runoff onto pavements.

Yearly Scheduled Maintenance:

- Inspect surface of pavements for evidence of sediment deposition, organic debris, staining or ponding. If any sign of ponding are evident, contact a professional Pavement Cleaner for high performance vacuuming.
- Inspect the integrity of the pavements. Replace or repair any areas that show deterioration, such as slumping or cracking.
- At least once per year the pavements are to be vacuumed by a professional pavement contractor.
- In areas of the driveway that have been deemed clogged or impervious, the areas are to be vacuumed and the performance of the pavement shall be verified by the in-field test methodology described in ASTM C-1701.

Construction Period Erosion and Sediment Control

Prior to start of construction the following measures will need to be in place:

- Stake erosion control barrier on the locations shown on the site plan.
- Contact Engineer for a pre-construction meeting and inspection of the erosion control barrier.
- Install the stabilized construction entrance at the beginning of the driveway to prevent sediment from entering the roadway. Sweep roadway daily during the site construction period and end of day activities. No sediment shall be left on roadway.
- After every major storm event and on a weekly basis, verify erosion control barrier is held in place properly and sediment is retained. Remove accumulated sediment and replace barrier as needed.